THE IRON AGE

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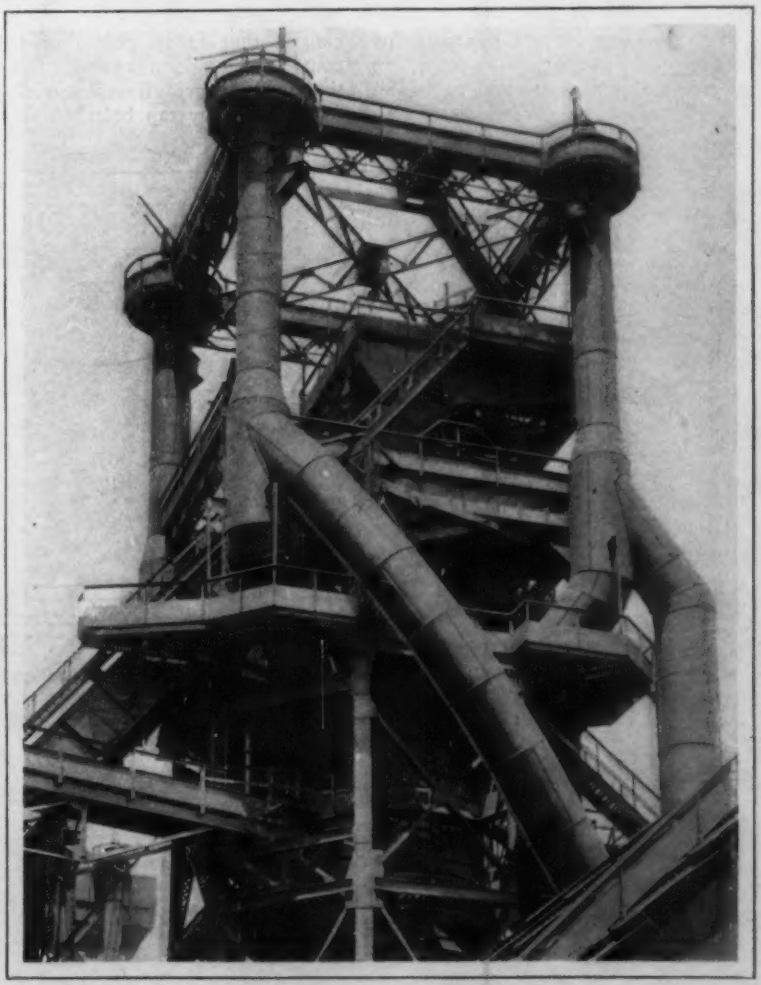
The Latest Thin-Lined Blast Furnace

The American Steel & Wire Company's Central Furnace D at Cleveland, Ohio — Gas-Blowing Engines and Special Safety Devices

One of the most modern blast furnaces and at the same time most completely equipped with safety appliances is Furnace D of the American Steel & Wire Company's Central group at Cleveland, Ohio, which was blown in in July, 1911. The furnace plant is located on the east side of the Cuyahoga River near Jefferson street and Broadway. Its A, B and C furnaces had an average daily capacity of about 1400 tons. They received their blast from seven vertical steam, compound condensing Allis-Chalmers engines, the steam being provided by three boiler houses, one containing 16 Cahall boilers of 4000 hp. and the other two containing 16 Stirling boilers of 4800 hp. The system of regenerative stoves consisted of four per furnace, all but one being of the two-pass, side-combustion type, with from 42,000 to 44,000 sq. ft. of heating surface in the checker work. The exception was one three-pass, center combustion stove.



General View of Top of Furnace Showing System of Downcomer Pipes, the Four Heavy Top Galleries and the Stairways Leading to Them

There is a casting machine equipment of two double machines which handles the Sunday Bessemer iron and all of the basic iron, the Bessemer iron during the week being delivered in 15-ton ladles to the mixers at the steel works, a distance of 6½ miles from the furnaces. The hot-metal ladle cars run over the Newburg & South Shore Railroad, which has a direct connection. The ore is delivered direct from boats to the furnace docks or to cars, which, in turn, are switched to the furnace bins. The capacity of the dock is about 700,000 tons.

In connection with the plant there is also a gas-driven, a. c. electric-generating station consisting of four units, each being twin-tandem, four-cycle Allis-Chalmers gas engines, driving a 1000-kw. generator. This station furnishes all of the power for drivin the Cuyahoga Works and part of that for the Newburg Wire Works.

The Original Thin-Lined Furnace Modified

At the time when the construction of this furnace was being considered furnaces with thin, water-cooled linings were receiving attention in this country and were operating with more or less success at the Lucy plant of the Carnegie Steel Company and the South Chicago plant of the Illinois Steel Company. But it could not be said that they had been established to a point beyond the experimental stage. At that time two types of construction were represented, the first consisting of a 12-in. lining and a rolled plate shell having overlapping water troughs riveted to the shell; the second, of cast-steel segments bolted together, while the cooling was effected by water flowing over the surface. Since then a third type has been built consisting of a rolled-steel shell 1⅛ in. in thickness, which is cooled by water sprays so that there is a thin film of water flowing down the surface. There has also been developed a form of thin lining with water passages in the cast iron segments or staves, as illustrated in these columns December 28, 1911.

It was decided to experiment further on these lines in the construction of this furnace, and the rolled-steel shell seemed to be the advisable one to build. There had been one serious objection to the troughs riveted to the shell; leaks had occurred and were liable to occur

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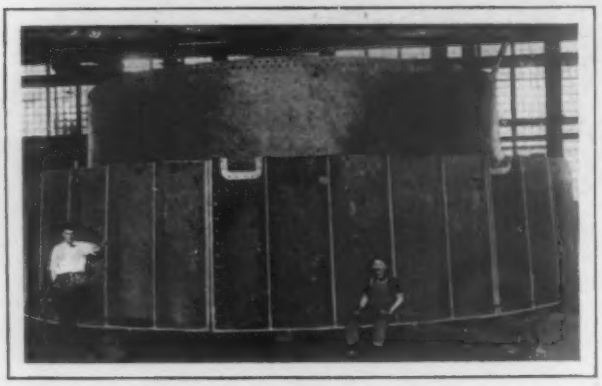


The Heavy Cast Steel of the Mantle Section and the Rolled Steel of an Upper Section of the Furnace Shell in Works of the William B. Pollock Company, Youngstown, Ohio

through the rivet holes in the furnace shell. To do away with this a 1-in. shell was built and holes drilled and tapped in it so that the troughs could be fastened on by means of cap screws. The holes were not drilled through the shell so that there was no danger from leaks.

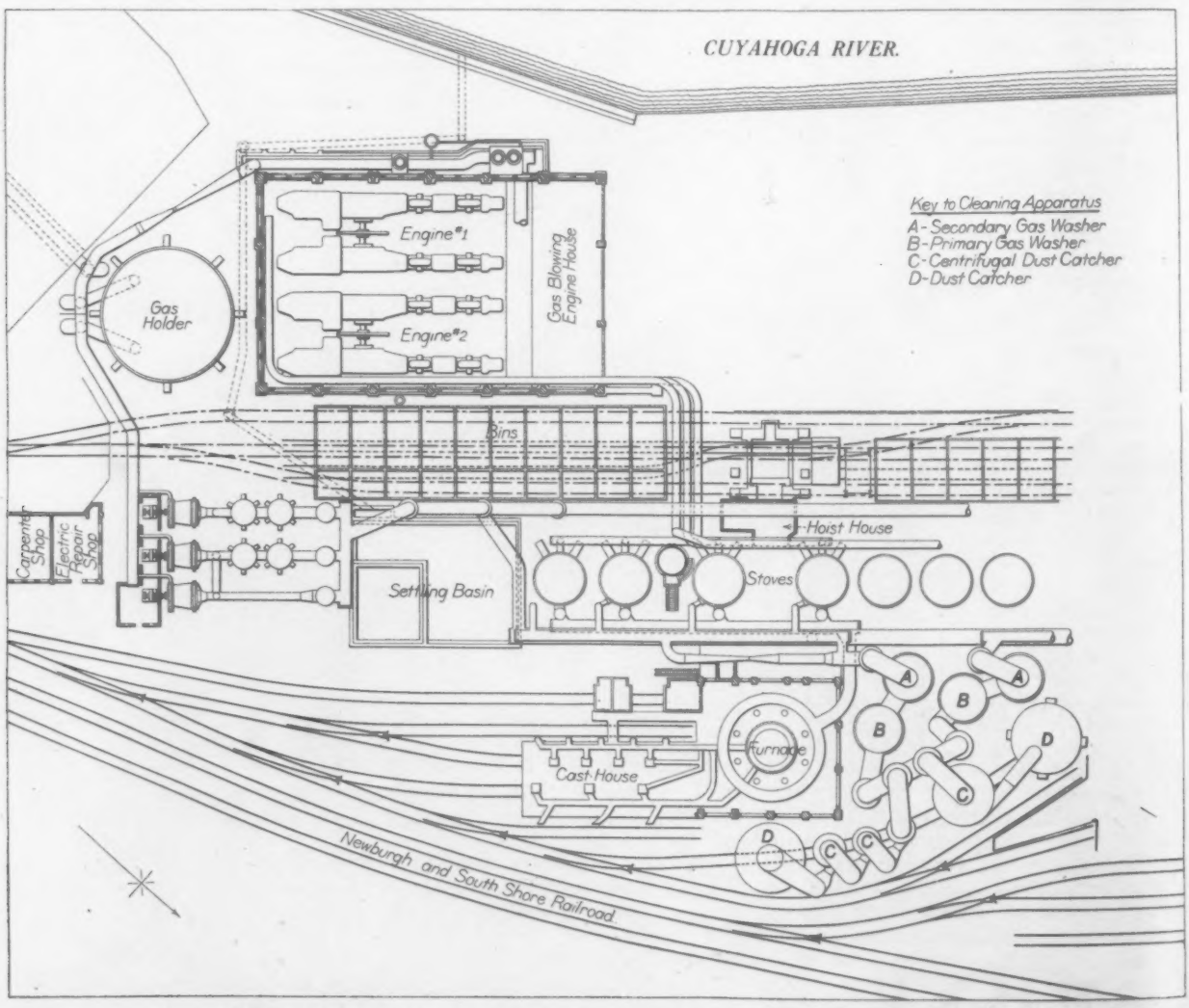
Blast Furnace Construction

The stack was built for an average daily capacity of 500 tons. The general dimensions are as follows: Hearth diameter, 16 ft.; bosh diameter, 23 ft.; stock line diameter, 16 ft.; height, 95 ft.; bell diameter, 12 ft.

The ground on which the furnace is built is part of the old river bed and there is an underlying bed of quicksand. It was necessary therefore to take considerable precaution in building the foundations. The piling was driven on a basis of 38 tons per pile, with a factor of safety of six, which amounted in surface to 9 sq. ft. to the pile. The piles averaged about 36 ft. in length and were driven to about 8 ft. below the yard level, which allowed them to extend 2 ft. above the bottom of the excavation. Concrete was put in the excavation to a depth of 10 ft., just bringing it to yard level. There are two foundation jackets, the bottom one being 47 ft. in diameter x 8 ft. 6 in. in height and 1¼ in. in thickness. This rests on the concrete and is filled with fire-clay paving brick. The second jacket is 42 ft. x 4 ft. 6 in. x 1½ in. and is filled toward the outside with fire-clay paving brick and in the center with second quality fire brick.

The hearth jacket is 24 ft. 6 in. x 8 ft. 10 in. x 1½ in. The base plates for the furnace columns are imbedded in the brickwork near the top of the second foundation jacket. The columns are made of cast iron and are eight in number. The furnace is so constructed that if it is found advisable to change to a thick lining it can be done by tearing down only the present shell and its troughs. On this account, and to take the weight off of the shell, the columns were so designed at the top as to support the superstructure for carrying the furnace top and skip bridge separately from the shell.

The bottom ring of the shell consists of heavy cast steel in eight sections and its cooling troughs are cast solid in connection with it. The eight sections are bolted together and rest on the furnace columns. There are also two 1½-in. bands around this built-up ring to hold it rigid. The shell above this section is of rolled steel, the first ring being 1¼ in. in thickness and the balance 1 in. in thickness. The diameter of the stack varies from 25 ft. 3 in. at the first ring to 18 ft. at the top. The top ring is reinforced by a 6 x 6 x 1-in. angle ring outside and a cast-steel segmental ring inside, which supports the hopper, etc. The straight seams in the shell are triple-riveted butt joints and the circular seams are double-riveted lap joints. There are eight troughs other than the mantle trough mentioned, which are about 7 ft. deep and so arranged that at all points of the shell below the downcomers there is a casing of water not less than 6 in. thick. As previously mentioned the troughs are fastened to the shell by tap bolts.



General Plan of Furnace D with Hot Stoves, Gas Cleaning Apparatus, Gas Blowing Engine House, Ore Bins, Etc.

The furnace lining below the mantle is generally of standard design; however, the jacket and bands are of very heavy construction. A sectional cast-steel tuyere jacket rests on the hearth jacket which has already been mentioned, and this is held rigidly by two 1½-in. steel bands. The cooling plates above the tryere jacket are allowed to rest on the outside in cast-iron boxes. The ends of these boxes also form rests for the 1½-in. bosh bands between cooling plates.

The thin lining begins at the bottom of the cast-steel mantle ring and extends all the way to the top. The brick are made in keys and squares, the squares being 12 in. x 10 in. x 5 in. in size and brick of the usual quality in grind, but burned quite hard. They are laid as closely to the shell as possible.

The stock line is protected by cast-iron wearing plates. These plates are L shaped and set into the brick, the brick at this point being laid up in a mixture of cement and clay. There are 15 courses of 30 plates each, spaced about 1 ft. 8¼ in. center to center.

View Showing Heay Platforms, Ladders and Stairways Around the Top of the Washers and Goggle Valves—Connection Subsequently Made to Furnace Platforms at Open Stairway

The skip bridge is centrally supported by a strong structural tower and the lower part rests on an abutment on which it can slide. The bridge is so designed as to have practically no bearing on the furnace top, and all that there is is carried by the superstructure. The arrangement of bells and hoppers is of the usual design for double skip system, and there is in connection with them a McKee revolving distributer.

Cooling System

The hearth is cooled by 2-in. extra heavy pipe welded at one end, set just inside the hearth jacket and extending down to the bottom of the second row of hearth blocks. They are spaced about 9 in. apart and the feed pipes, which are of ¾ in. diameter, extend to their bottom. The water is allowed to flow in and out the top of the 2-in. pipes and then down over the surface of the hearth jacket.

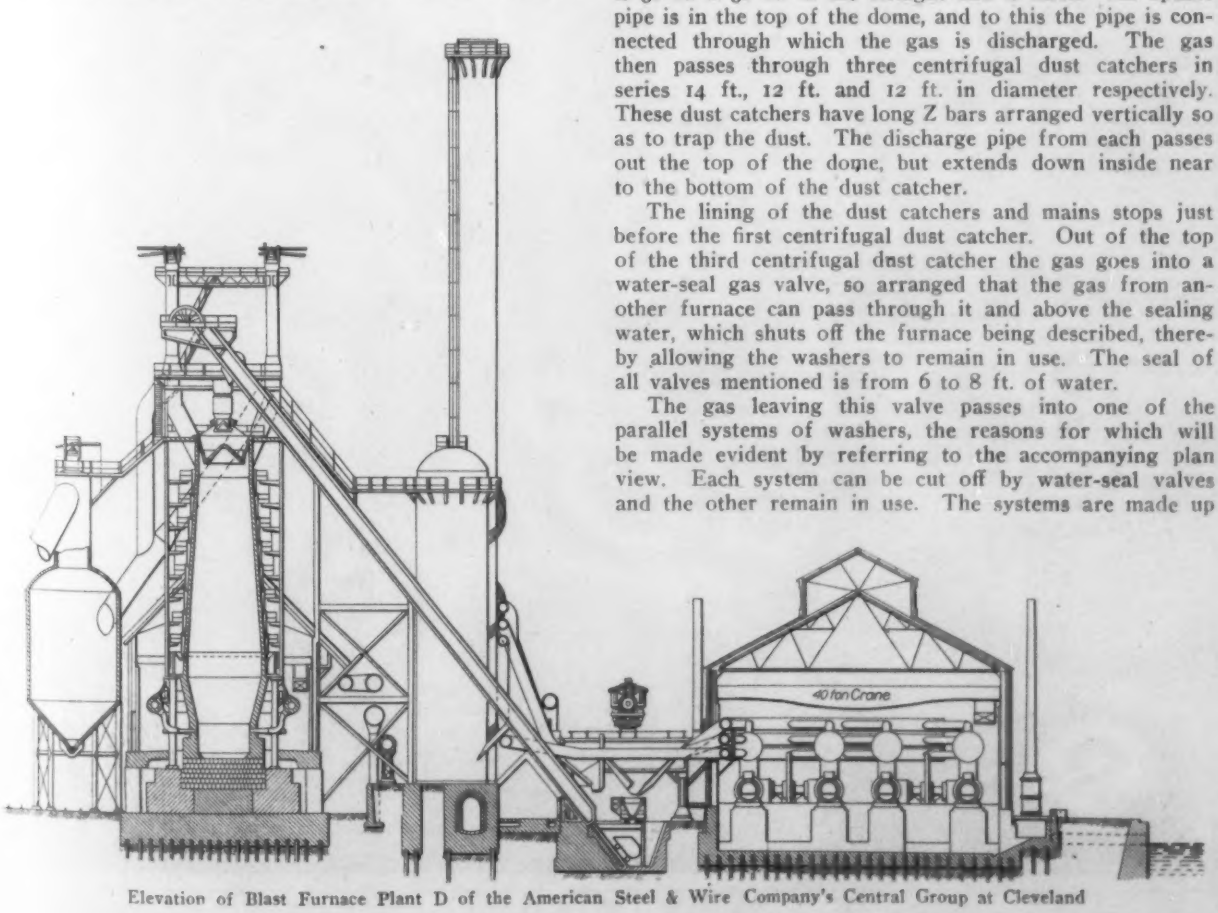
Around the shell the replacement of the cooling water takes place by feeding into the top bucket and from it into the three below. From the last of these four the water is discharged to the drain. Each of the troughs below is fed separately from the supply line and discharge water taken direct to the drain. In each of these troughs mentioned there is a baffle so arranged that the water which is fed in must travel entirely around the shell before being discharged. Each section of the mantle casting is fed separately. All of the troughs are connected to a stand pipe and the high-pressure system, thereby insuring against a possibility of a failure in the water supply.

Dust Catchers and Gas Mains

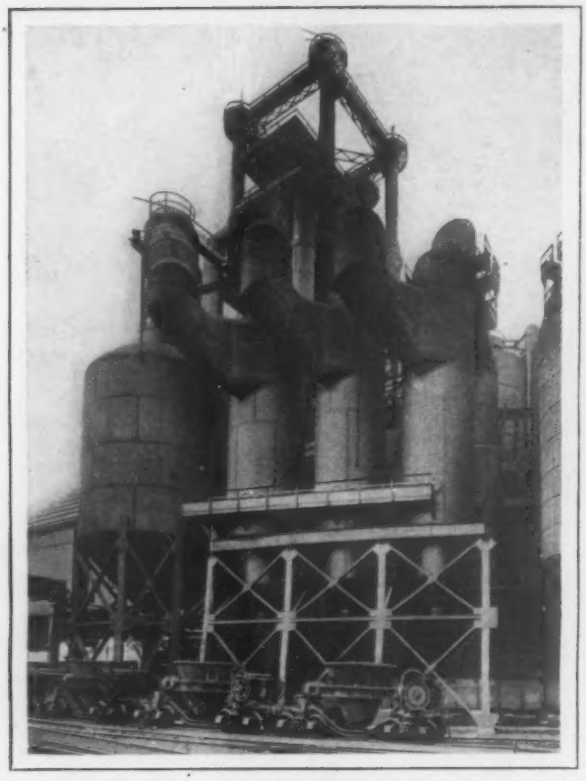
The gas is taken from the top of the furnace by four openings into as many riser pipes which support bleeders. The downcomers are connected into each of these and finally connect in such a way as to discharge into the large dust catcher by two openings. This dust catcher is 30 ft. x 30 ft. in the straight and is lined. An uptake pipe is in the top of the dome, and to this the pipe is connected through which the gas is discharged. The gas then passes through three centrifugal dust catchers in series 14 ft., 12 ft. and 12 ft. in diameter respectively. These dust catchers have long Z bars arranged vertically so as to trap the dust. The discharge pipe from each passes out the top of the dome, but extends down inside near to the bottom of the dust catcher.

The lining of the dust catchers and mains stops just before the first centrifugal dust catcher. Out of the top of the third centrifugal dust catcher the gas goes into a water-seal gas valve, so arranged that the gas from another furnace can pass through it and above the sealing water, which shuts off the furnace being described, thereby allowing the washers to remain in use. The seal of all valves mentioned is from 6 to 8 ft. of water.

The gas leaving this valve passes into one of the parallel systems of washers, the reasons for which will be made evident by referring to the accompanying plan view. Each system can be cut off by water-seal valves and the other remain in use. The systems are made up

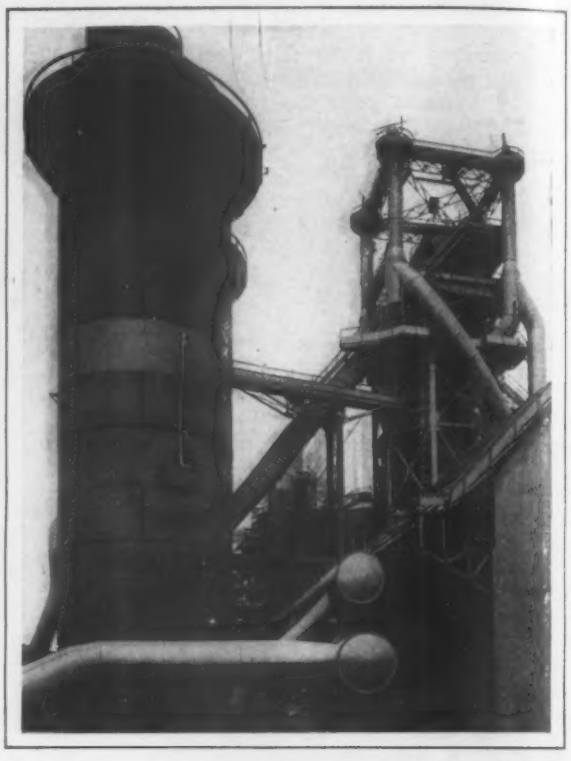


Elevation of Blast Furnace Plant D of the American Steel & Wire Company's Central Group at Cleveland

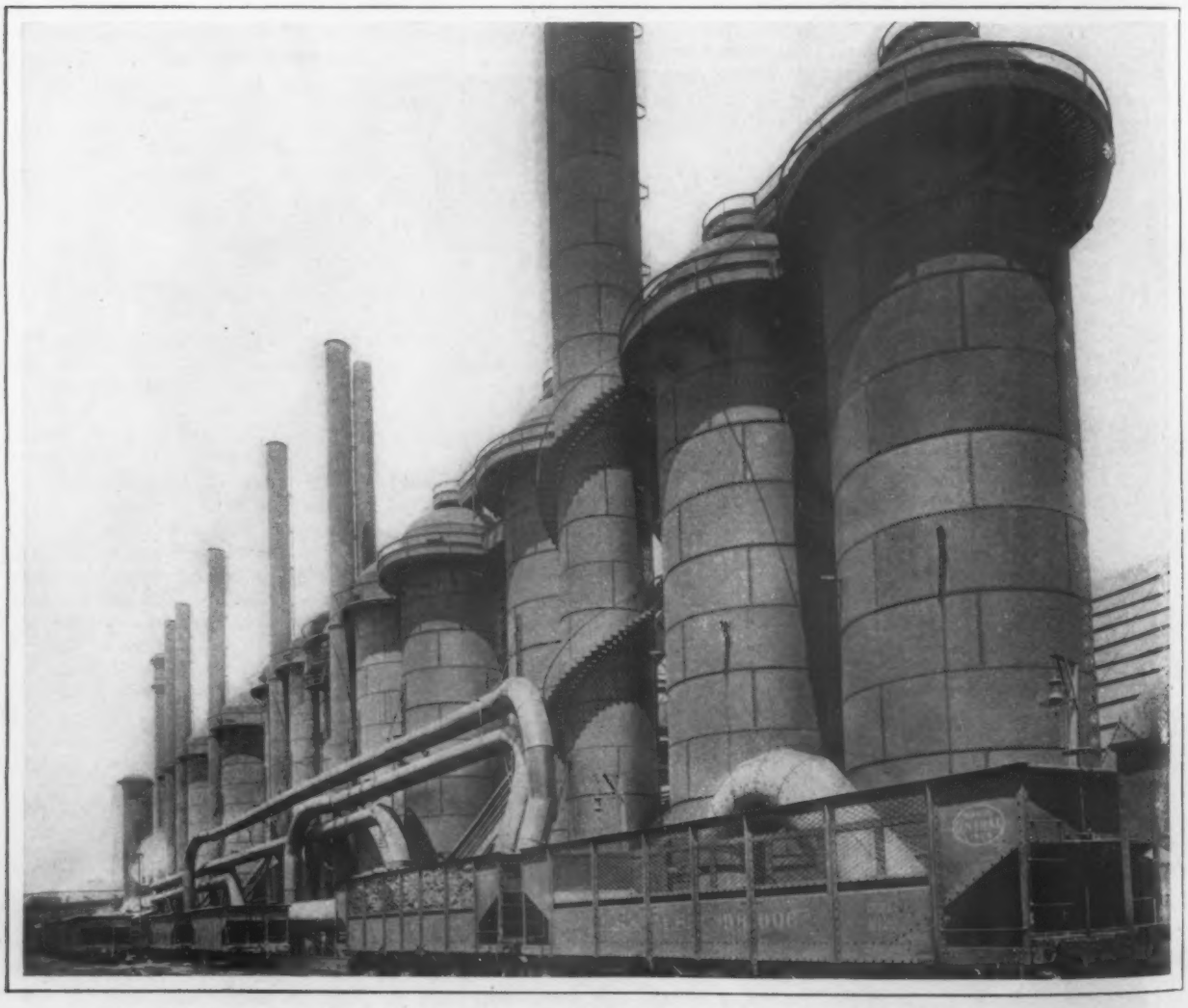


Large 30-ft. Dust Catcher and Three Centrifugal Dust Catchers—A Safety Feature in the Platform to the Infrequently Used Manholes

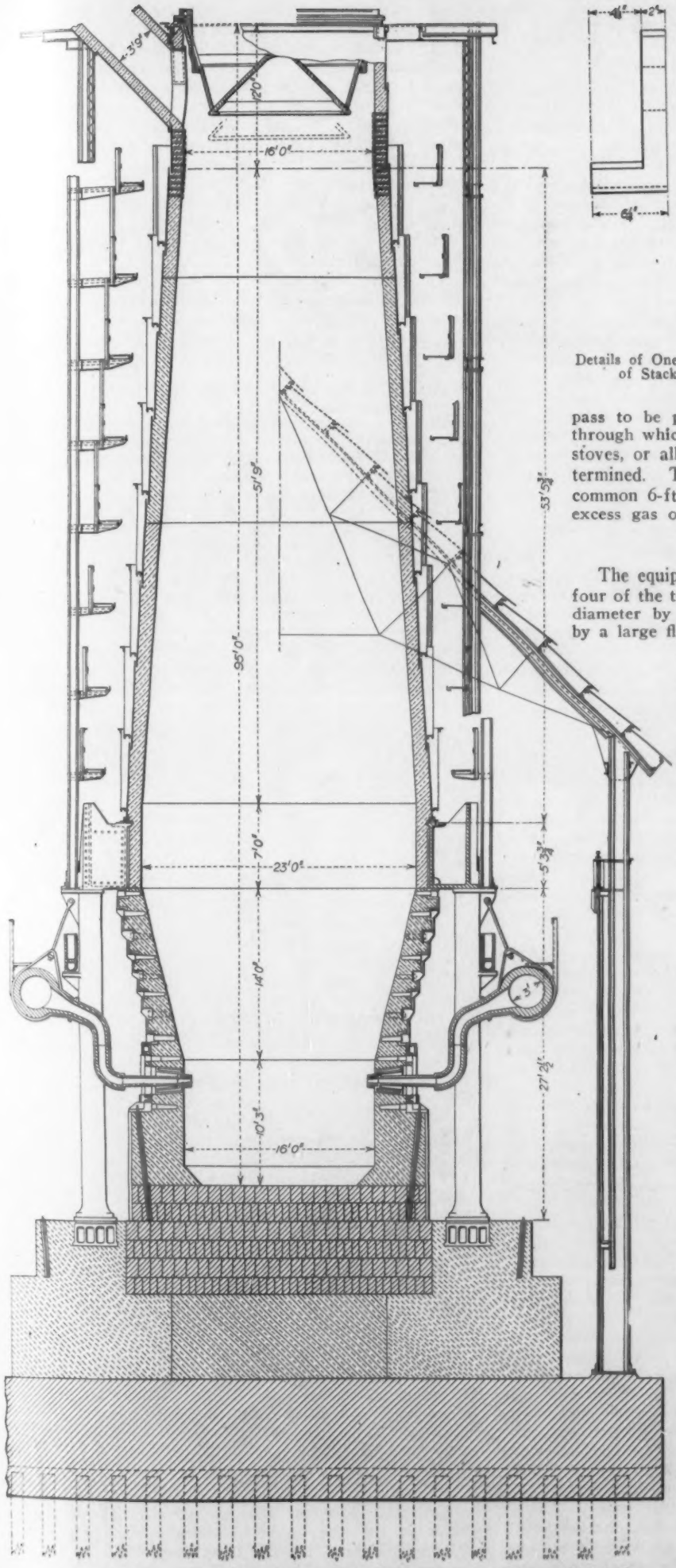
of two 20-ft. x 80-ft. baffle washers in series. The gas passes in at the bottom of the primary, goes to the top and then down through a central pipe and in at the bottom of the secondary, where it passes up and out of the top through a water-seal valve and into the upper main. To this main are connected all of the pipes leading to the stoves for this furnace, the object being to allow a by-



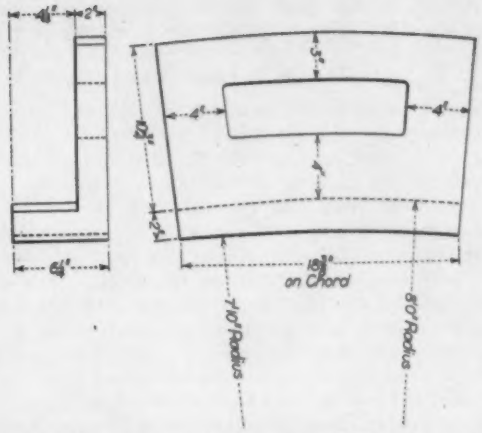
View Showing Platform and Stairway to Top of Cast House Roof, Angle Railing Along Top of Gas Main and Platform for Oiling Hot Blast Valve Sheave



View of the Stoves Showing Blast Piping, Lower Part of Skip Bridge and Railed Walks and Bridges at Top of Stoves



Vertical Section of the Thin Lined Furnace D of the Central Group, Cleveland, of the American Steel & Wire Company



Details of One of the Cast-Iron Wearing Plates at Bell of Stack—13 Rows with 30 Plates per Row

pass to be put in containing a Venturi meter, through which the amount of gas supplied to the stoves, or all of the gas produced, could be determined. There is a connection to a lower common 6-ft main which gives a relief for the excess gas over that required by the stoves.

Hot Blast Stoves

The equipment of hot blast stoves consists of four of the two-pass, side combustion type, 22 ft. diameter by 100 ft. high. They are connected by a large flue to a stack 220 ft. high by 10 ft. 6 in. inside diameter. The linings are of Harbison-Walker Clearfield brand first and second quality. The checkers, which are 6 in. square, are made by the use of brick 8 in. x 6 in. x 4 in. The total heating surface, including combustion chamber, dome and checkers, is about 46,000 sq. ft. The shell of the stoves is extra heavy, having ¾-in. sheets for the top and bottom rings and ⅝-in. for the intermediate rings.

Cast House

The cast house is 56 ft. wide by 134 ft. long, built up on heavy columns to carry a 40-ton crane. The roof is of plate steel with a steep pitch, in order to enable material to fall off freely. The floor is built on brick arches between the beams, with concrete above. The entire bottom of the furnace below the cast house floor is left open and in plain sight.

Blowing Equipment

With this furnace there were installed two horizontal, twin tandem Allis-Chalmers gas engines, the size of the gas cylinders being 44 in. x 60 in., while that of the air tubs is 80 in. x 60 in. These tubs are of the Slick type with a positively operated discharge valve. The capacity of the tubs per engine is 670 ft. per revolution. The engines are built to operate discharging full wind at their maximum speed and 22 lb. pressure. Above this pressure it is necessary to unload one end of one air cylinder, by which a pressure of 28 lb. can be handled at the maximum speed. Connections were also made whereby two of the other furnaces can be blown from this

station. The total weight of one of these blowing engines is 1,903,225 lb.

The Stock House and Equipment

The trestle and bins are all of steel and of as large capacity as was possible to put in the limited amount of room. There are 10 each of coke and ore bins, having a capacity of 20 tons of coke and 150 tons of ore per each bin. The coke and ore bins are parallel and the larry cars beneath run to the same point for dumping into the skip cars in the pit. All of the stock is delivered to the trestle in cars, there being no direct ore-handling stock bridge. Owing to the arrangement of the trestle it was impossible to use a central coke bin without rebuilding the part of the trestle already in use; therefore the line of coke bins and coke car was installed.

The gates to the bins are curved slides 20 in. in width, to which is fastened a lever arm by means of which the gates are hand operated. The larry cars were designed by the American Steel & Wire Company and built by the Scottdale Foundry & Machine Company. They are electrically operated by 35-hp. motors. The hoisting machinery was furnished by the Otis Elevator Company and is a double drum hoist operated by a 200-hp. motor. Its capacity is a lift to the top of the furnace of 12,000 lb. in addition to the weight of the skip car.

Pumping Machinery

In order to supply the increased demand for water for the washers and cooling of the furnace, and to insure sufficient pressure at the heights necessary, three centrifugal pumps were installed in connection with the existing installation. They are rated as follows: One two-stage, 2800-gal. capacity per minute against 142-ft. head and driven by 150-hp. Burke motor on 25-cycle, 440-volt circuit; two six-stage, 1400-gal. capacity per minute, against 362-ft. head and driven by 225-hp. Burke motor, same circuit as above.

Safety Features

Aside from the special feature of its being thin lined, furnace D is noteworthy for its safety devices. From looking at the installation it almost becomes a question as to which of these features is the headliner. Every effort has been made and neither time nor money spared in order to make the equipment as safe to life and limb as possible. It would seem that the danger which may exist has been reduced to a minimum, and otherwise dangerous places made "foolproof."

All couplings, collars, keys, set screws, etc., are of the safety type and all gears are fully provided with gear covers. In building the railings, platforms, etc., no angles or other structural material were used of less than ⅜ in. in thickness. The great extent to which heavy walks and platforms were built is clearly shown by the accompanying illustrations. There are three ways of getting to or from the top of the furnace.

1. The usual and easy way by a bridge from the stove platform. This bridge can be reached by ascending to the stove platform by way of a winding stairway around the stove draught stack, or by other stairs leading to the B & C furnace stove platform, which is connected to those of D furnace.

2. By climbing an inclosed ladder to the top of any one of the washers and thence across connecting bridges and finally a bridge leading to the furnace platforms.

3. By climbing an inclosed ladder to the top of the large dust catcher and thence by a small bridge and stairs to the furnace platforms.

At the top of the furnace there are four platforms or galleries connected by stairways, and so constructed as to make all of the furnace working parts easily accessible. The first is the usual charging floor platform and is made very large and roomy. The second is at the top of the stock-receiving hopper and from it the bell rods and large bell cylinders and counterweights can be reached. The third is for reaching the small bell cylinder and "bull wheels" for the skip cables. The fourth is made up of bridges connecting the bleeder valve platforms.

The bleeder valve is of the safety type, having in addition to the regular valve a bell hung inside of the pipe in such a way as to prevent large pieces of stock, such as coke and limestone, from getting out during a "slip." This does not in any way interfere with the pressure relief.

The bottom of the skip bridge is covered with plates so that material falling from the skip cars or from other sources cannot endanger men below, but is caught and allowed to roll down the plates until near the bottom, where it strikes a plate at right angles and is deflected into a coke buggy by means of an attached chute.

Although there are four other ways of reaching the cast house, there is a large bridge over the main line tracks of the Newburg & South Shore Railroad by means of which the furnace men or those going to and from the furnace to the office or gate can do so without crossing the railroad tracks.

In order to show further the extent to which the element of safety to the men was considered, the following figures are given. They are based not on the total for platforms, walks, etc., but upon the additional installation to promote safety over that ordinarily built.

Walks: Including crane runways, hand railings and stairs	113,000 lb.
Platforms: Around goggle valves, bleeders, chimney, hot blast valve sheaves, skip sheaves, water valves and furnace test rod.	208,000 lb.
Bridges: From washers to furnace, dust catcher to furnace, along top of stove dome, etc...	105,000 lb.
Other stairways: Extra to bustle pipe, to top sheaves, between goggle valve platforms, to strainer and valve platforms, etc.....	22,000 lb.
Ladders: To hot blast valve sheaves, to top of gas washers, to top of dust catcher, to goggle valves and to furnace test rod platform.	26,000 lb.
Cages around counterweights: At hot blast valves, bleeder valves, dust catcher, etc....	4,000 lb.
Miscellaneous: Bin gratings and other small platforms, etc.	1,500 lb.
Total.....	479,500 lb.

These figures together with the descriptive matter preceding them will serve to show what has been done to safeguard workmen; and consistent with it equipment on the other furnaces of the Central plant is gradually being put into the same condition.

The Underwood Tariff Bill Passes the House

Quick work has been done by the House of Representatives in disposing of the Underwood bill for the revision of the iron and steel schedule of the tariff. The bill was reported to the House on Thursday, January 25, and was passed on Monday, January 29. The vote on its passage was 210 to 109. Only minor changes to correct typographical errors were made, despite strenuous efforts to amend it by Republicans and by the Colorado delegation, all Democrats. The bill as passed is identical in every essential with the original draft as ratified by the Democratic caucus.

Most of the Republican insurgents voted in the affirmative, but there was sufficient disaffection in this wing of the minority to cause doubts as to the fate of the bill when it reaches the Senate. Senator Cummins has a bill which he is ready to propose as a substitute, largely based on his opposition to the transformation of specific duties into ad valorem duties. Other progressive Senators have propositions to offer when steel revision is ready to be fought out on the floor of the Senate. The regular Republican members of the Senate Finance Committee are already figuring on hearing various persons interested in the steel industry who have applied to the committee.

The Thomas Iron Company is preparing to blow in its No. 3 furnace at Hokendauqua, Pa. When operations are begun its No. 1 furnace, at the same location, will be blown out. This company has recently blown out several of its furnaces and has no intention of increasing its active capacity.

Henry C. Holsman, architect and consulting engineer, announces the removal of his office to 1218-1219 Fisher Building, Chicago, Ill. The lines along which he specializes are the design of high-class commercial and industrial buildings and mechanical transportation and engineering.

President Farrell's Further Testimony

Prices on Export Steel Products—Relations with the International Harvester Company —The Publication of Production Costs

In *The Iron Age* of January 25 a report was given of the examination of President James A. Farrell of the United States Steel Corporation before the Stanley Committee at Washington. Additional facts, chiefly developed in Mr. Farrell's second day's testimony, are presented below. It was apparent that the committee developed some very different answers to some of its questions from what was expected, particularly as to alleged special prices to the International Harvester Company and as to prices charged foreign consumers for domestic steel products. It was not known to the committee, apparently, that the International Harvester Company, through its subsidiary, the Wisconsin Steel Company, has been a competitor of the Steel Corporation and of other producers of steel bars.

No Dealings with Harvester Combine

In reply to a question Mr. Farrell denied that the Steel Corporation is on close terms with the International Harvester Company. Before the Rules Committee it had been charged by advocates of an investigation of the Harvester Company that the latter and the United States Steel Corporation are controlled and dominated by the same majority stockholders. President Farrell, when asked whether the Steel Corporation, as alleged, grants special allowances to the Harvester Company, said:

"We do not. We have done no business with the International Harvester Company for five or six years. The Harvester Company has boycotted subsidiary companies in the United States Steel Corporation. Beginning with a mere quibble between salesmen, it has resulted in complete estrangement between the International Harvester Company and the United States Steel Corporation. We do not even do business with them."

Export Prices Sometimes Higher

Judge Bartlett of Georgia and Representative McGillicuddy of Maine put questions to Mr. Farrell designed to bring out the low prices at which domestic steel products are sold abroad as compared with the prices to home consumers. Mr. Farrell cited instances of higher prices realized on Steel Corporation exports than on sales at home The domestic price on barbed wire in 1911 was $1.85 at the mills. The export price on barbed wire was $2, delivered ready for export. The domestic price on nails was $1.55 a keg; the foreign price $1.65 at New York, to which must be added the cost of transportation, which the foreign consumer would have to pay.

The price of standard steel rails to domestic buyers is $28 a ton. The price of American-made steel rails to consumers abroad in cases cited by the witness was $31.70. The Steel Corporation paid the freight. "We pay the freight," said Mr. Farrell, "but the consumer pays the price. Our price to the foreign consumer is $31.70. After we deduct the freight the result to us is $24.98, but the foreigner does not get his rails at that price. The difference to the consumer abroad is the increase in freight charges. The price of rails is today lower than in any other country in the world. The price in Great Britain is $28.50, in Germany $28.75, in Belgium $28.13, in France $32.81, in Russia $35.46, in Italy $36.89, and in Canada $32. The tariff on steel rails in various countries is: Germany, $6.03; France, $17.70; Russia, $28.60; Spain and Italy, $11.76; Austria-Hungary, $12.32, and Canada, $7.84. The tariff on rails entering the United States is $3.92."

Representative Gardner sought an explanation of the fact that the price of standard steel rails had remained fixed at $28 a ton for ten years, when the price of all other steel products had fluctuated. Mr. Farrell explained that the $28 figure for years had been regarded as a fair price, and because the cost of manufacture of rails had steadily increased no one would lower the price. Mr. Gardner asked why the price was not raised.

"I believe that the price will be raised," Mr. Farrell responded. "I do not think it will remain at $28 a ton much longer. The Republic Iron and Steel Company, which has a rail mill, has not operated it because it thought the price did not bring a fair return." Mr. Farrell explained that the United States Steel Products Company, the subsidiary company handling the foreign business of the corporation, owned a steamship line known as the Isthmian Steamship Company, which it was forced to build because it could get none of the foreign steamship companies to handle its freight to countries in Central America. The export business of the Steel Corporation had increased, he said, from $31,000,000 in 1904 to $69,000,000 in 1911.

No Agreement on Prices

To the question whether the Steel Corporation was not bound, in changing prices, to tell its competitors, Mr. Farrell answered in the negative. "There is no understanding that such notification should be given," he said. "Whenever a change of prices is made competitors find it out within ten minutes. If I should meet a competitor on the street or at lunch I would not hesitate to tell him we were going to make a change in prices if one had been decided upon."

President Farrell denied that the Steel Corporation gave any rebates or discounts to the Standard Oil Company on tin plates for cans. "The minutes of the Carnegie Company," said Mr. Stanley, "show that rebates were given to the Standard Oil on tin plate."

"Since I have been President of the Steel Corporation," said Mr. Farrell, "all tin plate has been sold to the Standard Oil Company and all other companies at a flat price."

Returning to the question of prices, as between companies, Mr. Farrell said: "I do not believe the prices of any two steel manufacturers in the United States to-day are alike."

"Why has Judge Gary said that the day of competition has passed?" asked Representative Beall.

"I think he referred to destructive competition," said Mr. Farrell. "As a matter of fact, steel prices to-day are very low. There is no doubt that reports of some corporations soon to be made will show that they are not getting the cost of manufacture out of the present prices. Some of the smaller concerns are perilously near bankruptcy.

On Exchanging Costs of Production

The question was asked whether steel manufacturers did not disclose costs of production among themselves and, if so, why that information should not be given to the committee. He insisted that they did not go into the question of costs, even at the Gary dinners. Answering a question as to his own statement at the Gary dinner of January 11, 1911, that he believed the policy of the corporation was to co-operate as fully as possible with its competitors to maintain fair prices, Mr. Farrell said that he still believes in that policy because it enabled the payment of fair wages to labor.

Mr. Farrell was asked whether there was not a meeting of steel men immediately after the Republic Iron & Steel Company made its reduction in prices, at which announcement was made by Judge Gary that the cut would be met. He said that was true. "But it is the smallest manufacturer in this country who makes the market. It is a mistake to suppose that the United States Steel Corporation makes the market. If some one offers to sell an article at $1 we cannot sell at $1.25. The Republic Company made its reduction because it expected to accomplish a reduction of 15 per cent. in wages, and it was surprised the other companies did not follow suit. The Republic has since been advancing its prices of its own volition because it found its cut rates unremunerative."

"In your speech at the Gary dinner in January, 1911, said Representative Beall, "you spoke of maintenance of fair prices."

"I still have the same thought. I have urged fair prices to maintain wages for employees. Many small concerns in this country are now striving to reduce wages. We do not want to do this."

When asked for detailed statements of costs of rails, tin plates, sheets, bars, wire rods, ingots, etc., Mr. Farrell protested against such publication, as it would give foreign competitors innermost trade secrets. "Why, with that information in the hands of foreign manufacturers, our foreign business would not be worth a dollar in twelve months," he said.

Chairman Stanley insisted that it was necessary to have that information to ascertain the difference of cost of production here and abroad. "Come what will, if it is within the power of the Federal Government I propose to know it."

Mr. Farrell, in submitting a summary of cost sheets, said that he was perfectly willing to allow the committee's representative to examine the original from which the summary had been prepared. He said it was costing the corporation 50 cents a ton more to make pig iron now than in 1909. He added that he would not object to the publication of composite costs of making pig iron or blooms, but he would object to the publication of costs of more finished products. If they were made known competitors would estimate bids of the corporation to a fraction before they were opened.

Pelton-Doble Combination

Announcement is made of the absorption by the Pelton Water Wheel Company, of San Francisco and New York, of the entire rights, including patents, goodwill, patterns, etc., of the water-wheel business formerly conducted by the Abner Doble Company, San Francisco.

W. A. Doble, former head of the Abner Doble Company, goes to the Pelton Water Wheel Company as its chief engineer, vice George J. Henry, Jr., who, until, recently, occupied that position.

A particularly strong combination is thus formed, as these companies have for years been recognized as pioneers in the development of hydroelectric engineering, and their merged experience, together with the patents now controlled by the Pelton Company, constitutes an organization with the best of facilities to cope with any problems in the field of hydraulic engineering.

In addition to Pelton and Doble tangential water wheels, the Pelton Water Wheel Company manufactures the Pelton-Francis turbine, adapted for medium heads and large powers, besides a line of high-grade centrifugal and turbine pumps. Pelton oil pressure governors are also a feature of this company's product.

The Atlantic department of the company, with offices at 90 West street, New York City, has recently completed a large and well-equipped machine shop in Harrisburg, Pa. Thus the two points of manufacture facilitate deliveries to all parts of the world. J. V. Kunze, who has been manager of the Pelton Water Wheel Company since 1893, has been elected vice-president of the company, but will continue in charge of the New York office.

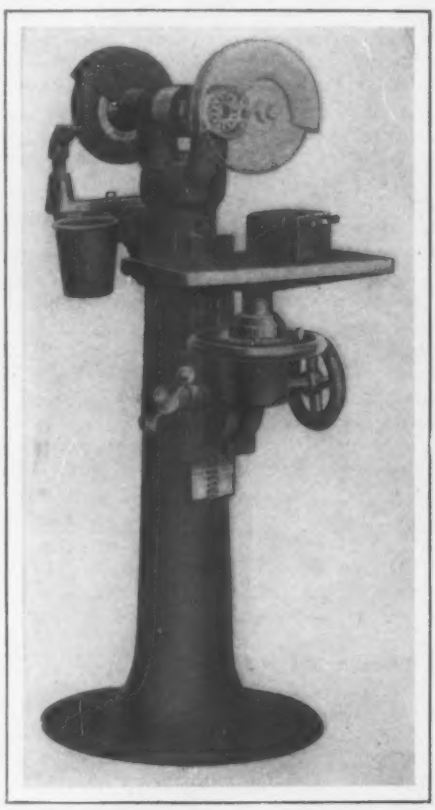
The pipe foundry of the Oregon Iron & Steel Company, Oswego, Ore., was destroyed by fire on the morning of January 9, the main building being a total loss, though some of the outbuildings were saved. The loss is estimated at about $50,000, largely covered by insurance. The loss was mostly on the machine shop, foundry and coke shed. The plant was erected 23 years ago. The company has a contract for 3800 tons of water pipe for the city of Portland, which will probably be turned over to Eastern manufacturers.

At the recent annual meeting of the stockholders of the Brier Hill Iron & Coal Company, owning and operating Grace furnace, Youngstown, Ohio, the following officers were elected: H. H. Stambaugh, president; Fred Tod, vice-president; R. C. Steese, secretary and treasurer; J. G. Butler, Jr., general manager. The directors include the officers and David and John Tod.

Ball Bearing Grinder

In addition to its No. 1 plain and surface grinder, the LaSalle Machine & Tool Company, LaSalle, Ill., has added a ball-bearing tool to its line. In the construction of this new grinder every precaution has been taken to protect the working parts from wear. To the upper end of the feather is fastened a dust ring, which protects the elevating screw and the post bearing from grit and emery dust.

A weight inside the column is used to counterbalance the knee and the table. The table, which has a vertical travel of 12 in. on the guides and can be fed ¾ in. by the micrometer feed, has a working surface of 8 x 14 in., and can be raised to within 2 in. of the spindle center. The wheel will grind to the center of a surface 9 in. wide and a horizontal hand wheel, which encircles the post and engages it by the screw thread, provides a fine adjustment



A New Type of Grinder Equipped with Ball Bearings Built by the LaSalle Machine & Tool Company, LaSalle, Ill.

of the table for the depth of the cut. This hand wheel carries a large dial graduated to read in thousandths of an inch, while the opposite side of the grinder is equipped for plain work. The spindle is of steel and runs in ball bearings at the rate of 3000 r.p.m. The bearings are reamed simultaneously to insure perfect alignment. The moving parts have adjustment for taking up the wear and all the adjusting screws are case hardened.

The following table gives the principal dimensions and specifications of the new grinder:

Distance to spindle center, in.	40
Distance between wheels, in.	15
Diameter of pulley, in.	3¼
Face width of pulley, in.	2½
Diameter of driving pulley, in.	10
Face width of driving pulley, in.	2¼
Diameter of tight and loose pulleys, in.	5
Face width of tight and loose pulleys, in.	2¼
Countershaft speed, r. p. m.	1,000
Floor space, in.	18 x 24
Net weight, lb.	340
Crated shipping weight, lb.	450
Boxed weight, lb.	475

The equipment regularly furnished with the machine includes two 7 x 1 x ¾-in. grinding wheels, countershaft, wheel guard, water pot and chuck.

The Supreme Court of Ohio has declared constitutional the Ohio workmen's compensation law, and it will therefore go into effect March 1.

Duplex Milling Machine

Heavy Construction and Flexibility of Operation, Two Features of a Recently Developed Product of the Newton Machine Tool Works

Constructing a duplex milling machine which would embrace all the modern features of construction, and while heavy and rigid would at the same time possess flexibility in its operation, was the object borne in mind of the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., in designing its latest machine. Fig. 1 shows the operating side of the new machine, while a view of the rear or driving side is given in Fig. 2.

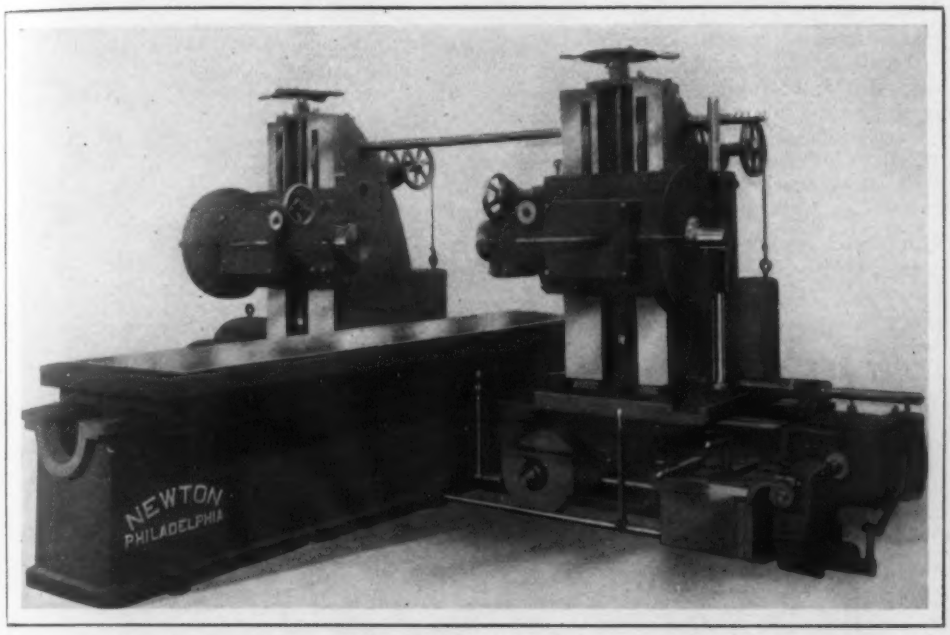


Fig. 1—The Operating Side of a New Duplex Milling Machine Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

To bring about the measure of flexibility desired, the spindles of the machine are mounted in sleeves, have straight and taper bearings and are arranged with broad face key and through retaining bolt. The spindle sleeve is adjusted by a pinion meshing in the sleeve rack, and fine adjustment is obtained by a worm and worm wheel which is graduated to give measurements as fine as 0.001 in. The diameter of the spindle is 4⅜ in. in the driving worm wheel sleeve and ⅜ in. less in the driving gear. The spindle, which is fitted with a No. 13 Brown & Sharpe taper, is arranged to drive the cutters by a face key, and they are held in place by a through retaining bolt. Each spindle has a hand adjustment of 6 in., and the minimum distance between their ends is the same. The maximum distance between the ends of the spindles is 60 in.; the maximum distance between the table and the spindle centers, 36 in.; the minimum distance, 2 in.; the width of the working surface of the table, 30 in., and the width of the work table over the oil pan is 36½ in. The length of the table is sufficient to mill pieces up to 11 ft. long. The spindle saddles are counterweighted and have hand vertical adjustment and square lock bearings on the uprights with very broad faces. The adjustment is made by taper shoes and the alignment is controlled by the builder's special single guide bearing, an arrangement which is said to eliminate unnecessary friction. Hand in-and-out adjustment on the wing is provided for the uprights.

The work table is entirely surrounded by an oil pan, has a spiral gear and angular rack drive, as is shown in Fig. 2 and the clutches for controlling the feed and fast traverse can be operated from either side of the machine. A gear feed box giving nine changes of feed, ranging from 0.027 to 0.283 in. per revolution of the spindle, is furnished.

The machine is driven by a 15-hp. Westinghouse motor having a speed range from 600 to 1200 r.p.m., and giving spindle speeds of 7.1 to 49.2 r.p.m. The drive to the spindles is by a large diameter worm wheel, having a bronze ring with teeth of steep lead meshing with a driving worm of hardened steel, fitted with a roller thrust bearing, and both are incased for lubrication which is the builder's standard construction. As illustrated in Fig. 1 the drive for the spindles is clutched and can be stopped or started by the lever shown in front of the saddle, which can be done without it being necessary for the operator to leave his regular position.

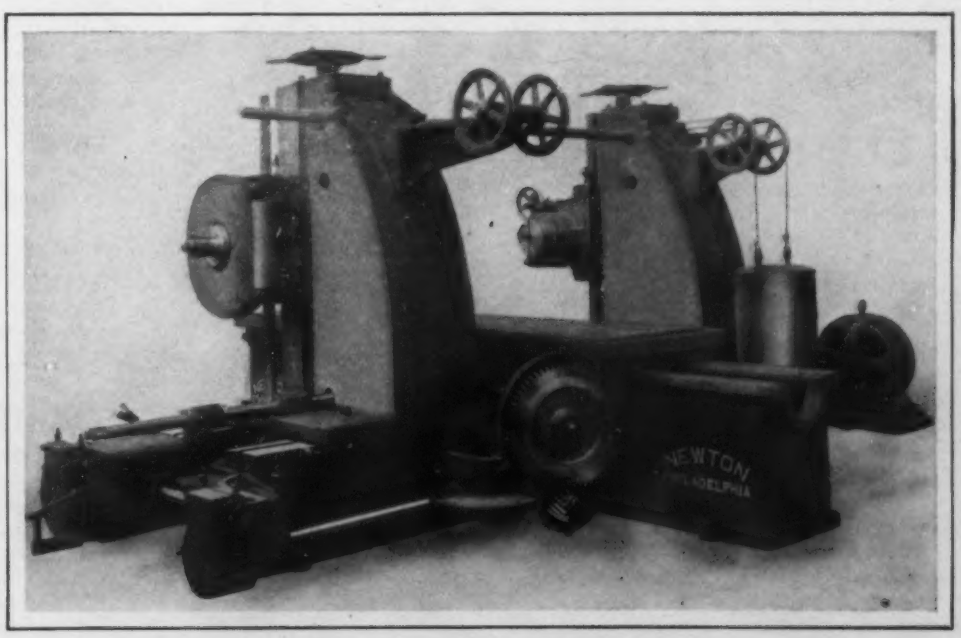


Fig. 2—The Rear or Driving Side of the Machine Showing the Spiral Gear and Angular Rack Drive for the Work Table

The net weight of the machine is 48,000 lb, and the floor space is 18 ft. wide by 15 ft. long, these being the maximum dimensions.

The St. Louis Steam Engineers' Club has acquired permanent quarters in the Odd Fellows Building in St. Louis and has opened with library, retiring and entertaining rooms all handsomely furnished and also a large auditorium. The club is increasing rapidly in membership and has frequent lectures on technical subjects.

The Production of Sound Steel

How Material Can Be Produced Which Will Be Free From Segregation, Blowholes or Piping

BY SIR ROBERT A. HADFIELD

The question of producing sound steel is quite as important a factor in meeting the requirements of the times as ever it was. By sound steel is generally meant material free from (*a*) segregation, (*b*) blowholes, and (*c*) piping. Unless these requisites are fulfilled trouble and breakdown of the material may occur in some stage of its history. Fortunately, as a rule, the remedy which obviates or overcomes any one of the difficulties tends to improve all. For example, steel which is sound and free from blowholes is less liable to segregation or intermingled slag, and the ingots made therefrom, if properly fed, will have the defects under (*c*), that is piping, largely reduced.

Methods Devised to Overcome Difficulties

Many simple devices as well as complicated arrangements have been suggested and tried to overcome the difficulties in question, as, for example, fluid compression from the top, also from the bottom; feeding and settling by gas generated heat; compressing or squeezing from the sides, and many other devices. These have given more or less satisfactory results. There are, however, some disadvantages in these systems, such as the expense of application owing to the heavy cost of apparatus, and so on.

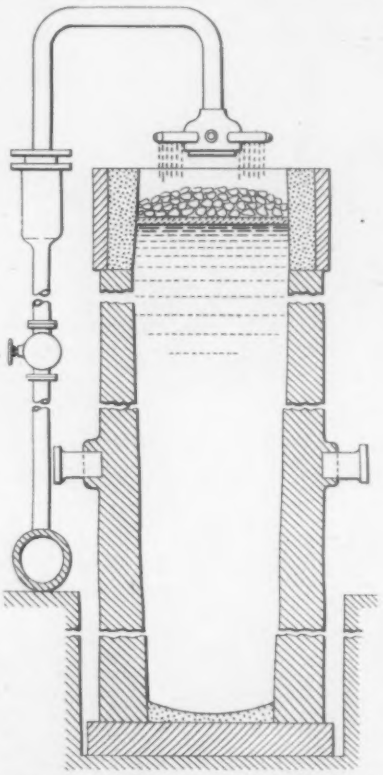


Fig. 1—The Hadfield Process of Avoiding Piping and Segregation by a Blast of Compressed Air Through a Bed of Charcoal at the Upper Part of the Ingot Mold

For some time I have been working at methods which I believe are simple yet efficient. Although the following description refers to patented methods, yet in view of the great importance of obtaining sound material I venture to think it may be of general interest to the readers of *The Iron Age*. A system of this kind with suitable modifications could be applied to the manufacture of sound ingots for rails and other purposes. The terrible results of railroad disasters, such as that on the Lehigh Valley Railroad, show the importance of obtaining sound material in the ingots from which the rails are to be rolled.

At the works of my company, Hadfield's Steel Foundry Company, Ltd., Sheffield, England, large quantities of special steels are made, in which it is absolutely essential to have material perfectly sound and free from defects such as mentioned under the bases (*a*), (*b*) and (*c*). The method now described has enabled the desired object to be fulfilled both cheaply and efficiently. Moreover, it has the important advantage of enabling not only soundness to be obtained but also a much larger percentage of the ingot to be used, and this with perfect safety. As will be seen from the results of the experiments described, in many cases no less than 93 per cent. of the fluid steel in the mold is made utilizable, and this at small expense.

Granted, therefore, sound piping or settling steel in the first instance, which is easily obtainable by ordinary care in manufacture, there seems to be no reason why ingots should not be made sound, free from blowholes, piping and segregation. This being so, rails or other articles rolled therefrom should be of the highest grade. It is true that large quantities of rails as now made are of excellent quality, but it is just the "tenth" case which it is important to improve. It is the bad heat here and there, the bad ingot now and then, which give the fatal rail which in service fails, involving catastrophe and all the troubles consequent upon such disasters.

The Hadfield Method

The following description of the Hadfield method—covered by United States letters patents Nos. 933,751, 954,183 and others—of casting steel ingots, castings, etc., insuring soundness, freedom from piping and absence of segregation, may be of interest.

The method of carrying out the process is shown by the accompanying Figs. 1 and 2. As will be seen, this consists in heating the metal in the upper part of an ingot or other mold and maintaining it in a liquid condition by the combustion in contact therewith, or in close proximity thereto, during the cooling and shrinkage of the metal in the lower part of the mold, of solid fuel—for example, charcoal—by means of a blast of compressed air which is caused to impinge on the fuel while the fuel is directly or indirectly supported by the metal below; also the interposition of a layer of fusible material, such as iron slag, which has no injurious action on the metal, between the metal and the fuel.

The cost of carrying out the method is trifling compared with the large saving gained in reducing loss and waste of material. Moreover, the quality of the product is improved; for example, in making rails produced from such ingots, not only would there be less discard but the material would be sounder. During the last few years many thousand tons of ingots have been made by this patented process, which has been found of great advantage.

As a specific example, it may be mentioned that ingots have been made weighing about 4000 lb. each, in which the

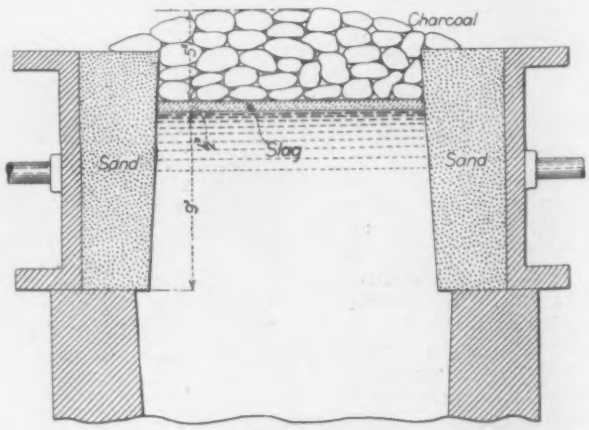


Fig. 2—An Enlarged View of the Upper Part of Fig. 1. The Mold is for a 15-In. Ingot

piping and discard do not amount to more than about 7 per cent. This small loss is not the only advantage, the chief one being that material is obtained which is quite sound and free from hidden pipes or other defects on the whole length of the ingot.

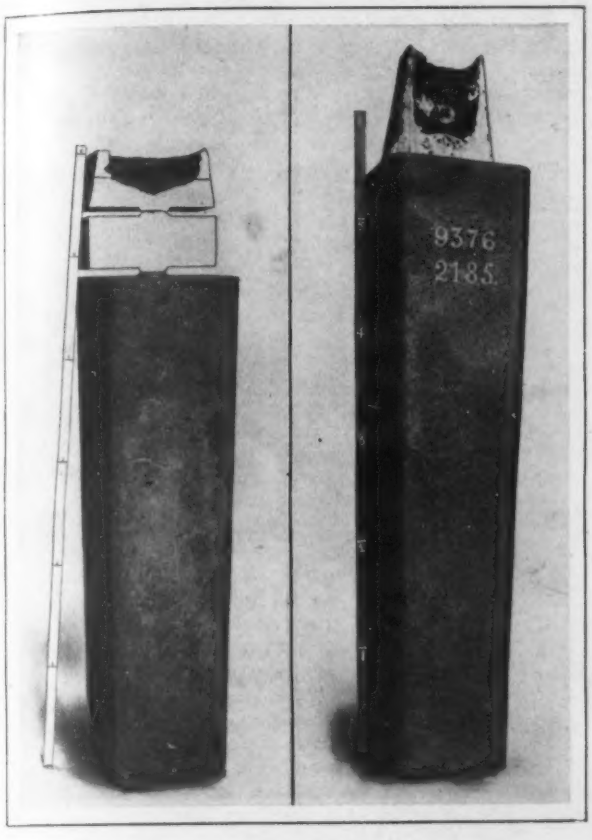


Fig. 3—Ingots Treated by the Hadfield Process

Fig. 3 shows the results of this patent method as carried out upon ingots weighing about two tons each. The system can be applied equally well to either smaller or larger ingots, for all kinds of purposes. It is estimated that on a large output the saving by this method would be from $2 to $3 per ton. Thus, on a large tonnage of hundreds of thousands of tons annually there would be a very considerable saving each year, as well as obtaining sound ingots free from blowholes, piping and segregation.

In this experiment the segregation only a few inches below the feeding head placed at the top of the ingot was almost entirely absent. At about 3 in. below the surface of the sinking head the percentages of sulphur and phosphorus were practically the same as in the original steel, namely, about 0.03 per cent. each.

The following is a description of the ingots made in heat No. 9376-2185 steel, and shown in Fig. 3: The sand "head" was 14 in. square where it joined the ingot, tapering to 9 in. square in a length of 16 in. The steel was filled up in the sinking head to a depth of 14 in., the remaining 2 in. of the sand head being filled with a layer of ground slag, having a thickness of about 1½ in. The slag was put on the molten steel, then the heating carried out by means of the charcoal and blast in the manner described in the patent specifications. The head was afterward cut off the ingot, and was found to be free from piping or segregation. Following are the details:

Total weight of ingot.			Weight of sand head.			Weight of sound ingot.		
Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.
38	3	0	2	2	10	36	0	18
(4,300 lb.)			(290 lb.)			(4,050 lb.)		

This is equal to a waste of about 6.7 per cent.

As will be seen from Fig. 3, the steel has "fed" well, practically the whole of the molten steel in the head having descended bodily to feed the cooling shrinkage of the ingot.

The head of 9376-2185 was drilled and analyzed to find if there was segregation. The results are shown in the table below. It will be seen that even C is almost normal in its composition, and D, a little lower down, has practically the same analysis as the bulk of the ingot. The original analysis in this heat, as shown by the test ingot, was: Carbon, 0.50; silicon, 0.16; sulphur, 0.033; phosphorus, 0.037; manganese, 0.80.

Position of test piece below surface of feeding head.	Analysis.		
	Carbon.	Sulphur.	Phosphorus.
A—1 in. below	1.41	0.175	0.135
B—2 in. below	1.20	0.12	0.10
C—3½ in below	0.59	0.041	0.041
D—where ingot itself commences	0.50	0.033	0.037

This ingot, with the sinking head described, is a still further advance in the improvements effected in this matter, the segregation being very slight. It would appear that 93 per cent. of this ingot may be utilized for commercial purposes.

Further Experiments with the Hadfield Process

The following further experiments with this patented method were carried out: Two heats were made of Hadfield's mild and ordinary steel. In the first the carbon was 0.20, silicon 0.40, and manganese 0.60; in the second the carbon was 0.45, silicon 0.50, and manganese 0.80. The ingots were prepared in the manner described in the Hadfield patents; that is, sufficient slag was placed upon the upper portion of the molten steel in the ingot mold, then charcoal and blast applied by means of the special blowpipe arrangement. Each ingot was provided with a sand-top, placed at the top of its ordinary length of the cast-iron mold. The exact method is shown by Fig. 1. The following were the results obtained:

Mild Steel.—Seven ingots were cast from heat X9428-1843, and seven cast from heat X9438-1843. Total weight, 6 tons 17 cwts. 2 qrs.; forged, 25.3.08.

	Tons.	Cwts.	Qrs.	Lbs.	Per cent.
Head scrap	0	8	0	0	6.0
Billet scrap	0	1	2	0	1.0
Forge waste	0	2	2	0	1.8
125 billets	6	5	2	0	91.2
	6	17	2	0	Total waste 8.8%

Fig. 4—Ingots of Various Types of Steel Cast by the Hadfield Process

Ordinary Steel.—Seven ingots were cast from heat X9387-6 and seven cast from heat X9396-6. Total weight, 6 tons 17 cwts.; forged, 24.3.08.

	Tons.	Cwts.	Qrs.	Lbs.	Per cent.
Head scrap	0	7	3	0	5.6
Billet scrap	0	1	0	0	0.7
Forge waste	0	2	0	0	1.6
126 billets	6	6	1	0	92.1
	6	17	0	0	Total waste 7.9%

These ingots forged well in each case, and the billets

produced therefrom were sound and satisfactory in other respects.

In the experiments made it was found that, with the exception of 8.8 and 7.9 per cent. waste, respectively, practically the whole of the remaining portion of the ingots represented salable and serviceable billets. The same results may be obtained with either small or large ingots.

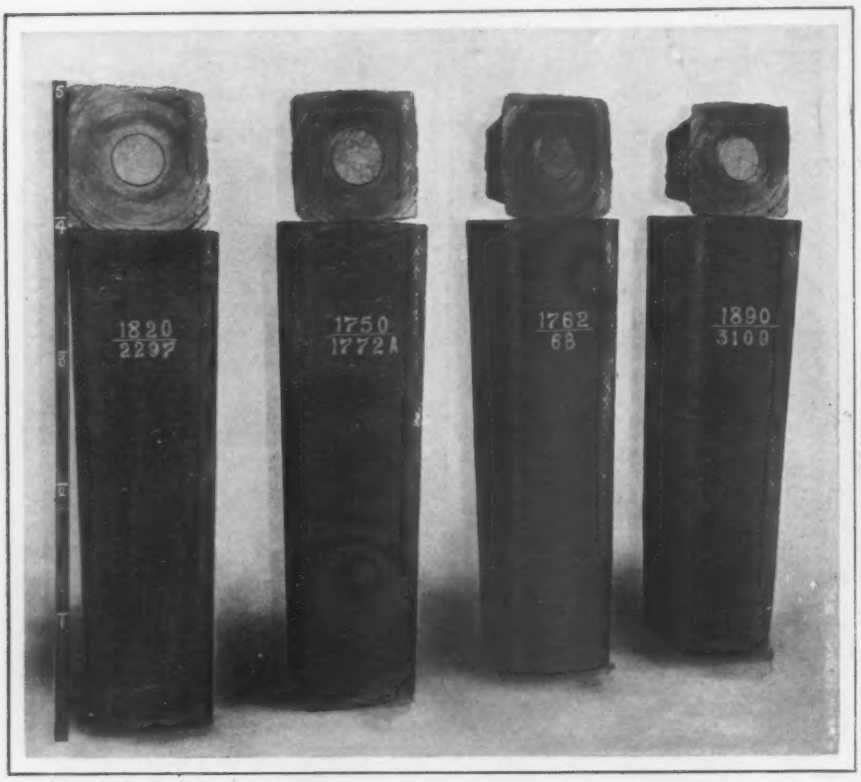


Fig. 5—The Same Ingots Shown in Fig. 4, Cut Off at the Shoulder

Figs. 4 and 5 show four of these ingots, each weighing about 2300 lb., of various types of steel. From the results obtained in the finished product it would appear that there is great improvement over the methods ordinarily practiced, whether as regards saving in waste or improving the quality of the material.

Machinery Manufacture in Switzerland

The Daily Consular and Trade Reports of January 29, issued by the Bureau of Manufactures, Washington, D. C., gives a report by Commercial Agent D. C. Alexander, on the machinery establishment of Sulzer Brothers, of Winterthur, Switzerland. He states that about 40 per cent. of the machine tools in these shops are of American manufacture and furnishes a list of builders and the number and character of their machines. He says that the machine manager of the Sulzer works expresses a very high opinion of American machine tools, but thinks that the prices of many American machines are unduly high as compared with those of similar German tools, and that the continual improvement being made in the latter must result in the reduction of American prices or the loss of much business to American machine-tool makers. The best German lathes, slotters, drills and large milling machines now so closely approximate American quality that a radical difference in price is no longer justified.

The manager also states that, in general, he is satisfied to buy American machine tools from the agents in Paris or Berlin, as they can usually supply tools from stock and deliver them at Winterthur, duty paid, thus saving him the trouble of arranging for transportation and customs. He also says that he believes that he can secure as good prices from the agents as from the manufacturers, since the agents are usually better informed than the manufacturers regarding the completion of European makers, and are likely to regulate their prices to meet this competition.

Mr. Alexander discusses this method of selling American machines as follows:

"This is perhaps correct from the standpoint of the buyer, but does not seem to be altogether satisfactory from the point of view of the American tool builder. Too many manufacturers are satisfied to sell their machines outright to their European agents, allowing these agents to resell at whatever prices they choose. This is undoubtedly a 'clean' business, free from vexations, and may have been an excellent method when European competition was negligible or when the American manufacturer had only a very limited number of machines to sell for export.

"In the first place, the agents cannot, because of the numerous lines they handle, be so well informed regarding each line as the man who specializes in one line alone. This is especially true in these days of increasingly complicated and specialized tools. Therefore the salesmen from Continental machine-tool factories are often able to secure orders that would have gone to American makers had the merits of the American tool been as skilfully presented to the purchaser. In the second place, the agent often conceals from the manufacturer the final destination of the tool, thus preventing him from following up the business properly. Furthermore, the agent's representative who calls upon the buyers is not likely to transmit to the American manufacturer the information that he acquires about the design, quality and price of competing machines.

"The foregoing remarks are intended as a suggestion to the American manufacturer that the time has come for him to lend a hand and cooperate with his European agents if he wishes to hold and increase his business. He should send abroad his own representative, thoroughly familiar with all the machines he manufactures, and require this representative to visit every plant in which tools of the class he manufactures are used. The manufacturer will then receive reliable and first-hand information regarding the requirements of European users, complaints regarding his own tools and descriptions and prices of competing machines. At the same time the users will be shown the full possibilities of the American tool and be informed of the latest improvements. In short, the American manufacturer must employ the same thorough methods that his Continental rivals are now using.

"The manufacturer is fairly entitled to know not only to whom his agents are selling his machines, but also the prices at which they are sold, and if these prices are found to be unreasonable, the manufacturer may well consider the advisability of fixing the prices at which agents must sell."

The American Society for Testing Materials

In accordance with a recent letter ballot of the membership of the American Society for Testing Materials the executive committee announces that it will arrange for holding the next annual meeting in New York City on Thursday and Friday, March 28 and 29, with a possible extension of the time through Saturday, March 30. This unusual time is appointed in place of late June and early July because of the session of the Sixth Congress of the International Association for Testing Materials which will begin in New York September 3, 1912. The American membership of the International Association has been increased by over 100 in the past six months and is now 571.

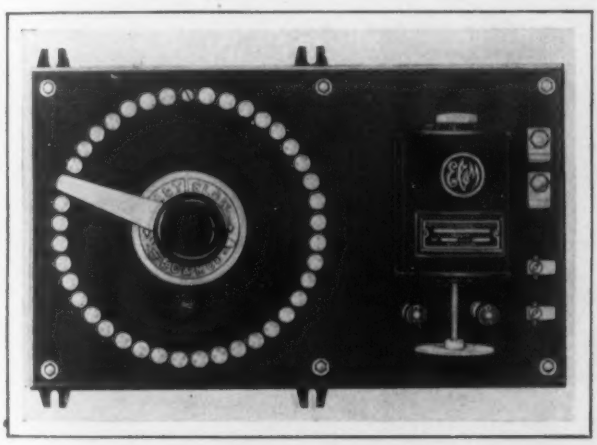
Representative Henry of Texas has proposed a constitutional amendment making the last Thursday of April the date for inaugurating presidents and vice-presidents.

New Line of Motor Field Rheostats

For varying the speed of adjustable-speed, shunt and compound wound, direct-current motors, the Electric Controller & Mfg. Company, Cleveland, Ohio, has recently placed on the market a new line of motor field rheostats. The advantages claimed for the device are fire-proof construction, a constant resistance and ease of removing the various parts for repairs and adjustment. Another interesting feature of the rheostat is what is designated as the field rheostat relay, which is shown at the right of the accompanying engraving.

This relay has been developed to prevent the starting of a shunt motor with a weakened field which may render it impossible to accelerate the motor because of insufficient torque, prohibitive sparking at the commutator or the rush of an excessive amount of current with the result that the fuses are blown or the circuit breakers tripped. This relay consists of a solenoid and a steel plunger with a contact plate at its lower end for electrically connecting the contact studs. The magnet coil and the plunger are inclosed in an iron case which not only protects the device but also forms a part of the magnetic circuit. The connections are such that the coil is in series with the motor armature circuit and the two contact studs are connected to the terminals of the motor field rheostat so that the resistance is short circuited when the contact plate bridges the two studs.

The solenoid is designed so that when the current flowing in the motor armature circuit exceeds a certain predetermined maximum, the plunger is drawn up and the plate at its lower end connects the contact studs and thus cuts out all the resistance in series with the shunt field. In this way the motor is given its full field strength and consequently the maximum torque is developed, enabling it to accelerate the load properly. As the speed of the motor increases the current decreases and the plunger drops, thus inserting the rheostatic resistance in the shunt field circuit and weakening the field. This cycle of operations is repeated until the motor has been brought to the proper speed as determined by the setting of the rheostat. It is pointed out that the use of this rheostat results in the motor running at the proper speed no matter how frequently it is started and stopped. The relay is recommended for use in connection with the company's automatic motor starter or controller which was illustrated in *The Iron Age*, November 30, 1911, for additional protection during the acceleration period.



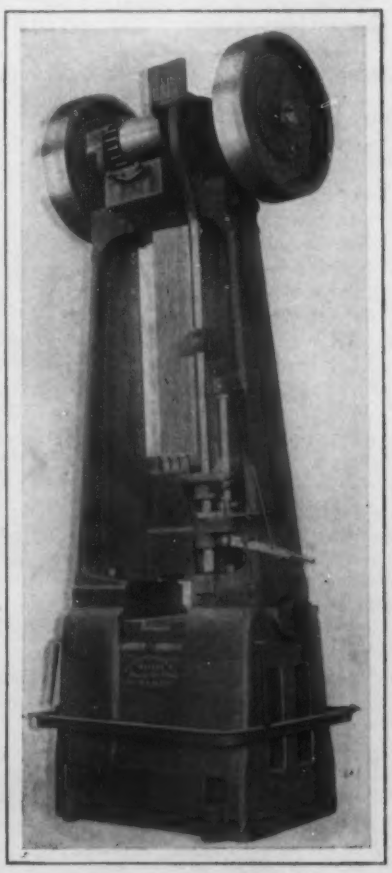
The New Motor Field Rheostat with the Field Rheostat Relay Made by the Electric Controller & Mfg. Company, Cleveland, Ohio

Alliance Crane Business.—The Alliance Machine Company, Alliance, Ohio, has just received an order from the Carnegie Steel Company for a 200-ton crane for its open-hearth plant at Homestead, Pa. The Alliance Company states that as far as it knows no crane of this capacity has ever been built. It reports the receipt of a good volume of business, having taken contracts for about 30 cranes since the early part of December. Among the orders received is one from the Hydraulic Engineering Company, Keokuk, Iowa, for three power house cranes, two of 150 tons capacity each and one of 75 tons capacity.

An Improved Board Drop-Hammer

Several interesting improvements have been incorporated in the design of the board drop hammer, built by Williams, White & Co., Moline, Ill. Absolute alignment is said to be now possible since adjustments are provided for both the front and the back clamp holding the board. The throw of the back clamp is limited, and while the faces of both clamps are so shaped that while a powerful grip is obtained on the board, the gouging of it is also prevented. This is further provided for by the cushions of the drop rod, thus limiting its fall and the grip or tension of the roll against the board. Referring to the accompanying engraving, a small projection on the foot of the guide that carries the drop rod will be noted. This is a pocket cast into the guide, in which are placed pieces of leather covered by a steel plate upon which the drop rod falls.

The ram is suspended from the center of the hammer so that the shock when the clamps grip the board is equally distributed through both sides of the frame. An improvement in the method of attaching the board to the ram has also been effected, and instead of securing it by two bolts passing through the ram, as was formerly the case, wedges and steel plates are now employed to secure a driving fit. One of the objections urged against fastening the board with bolts was that they not infrequently pull out, and when released the board ran wild and sometimes tore through the roof of the building. Other changes are the use of heavier latches, latch springs and a special quality of material for the drop rod, which is also heavier. Both belts are on the one shaft, power being transmitted to the second shaft by specially formed steel gears. The loose roll is bronze bushed, and the bearings are fitted with oil rings to conserve the supply of lubricating oil. It is also possible to lower the ram slowly from its highest or any intermediate position and a very heavy or light blow delivered as may be desired, special adjustments for this purpose having been provided for the hammer.



An Improved Type of Board Drop Hammer Built by Williams, White & Co., Moline, Ill.

An industrial exposition under the direction of the Indiana Business Men's Association will be given in Tomlinson Hall, Indianapolis, the week of February 12. Arrangements are being made to have this exposition representative of manufactures produced in the State of Indiana. The second annual convention of the association will be held during the week of the exposition. Fred Frohmuth, of Muncie, is president of the association, and A. Bogue, of Indianapolis, is secretary.

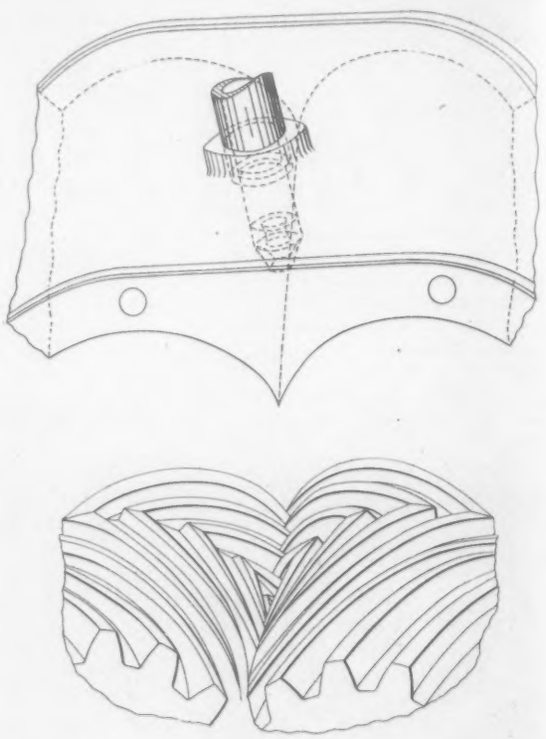
The Water Commissioners of Erie, Pa., have authorized Chester & Fleming, hydraulic engineers, Pittsburgh, Pa., to prepare plans and specifications for a 20,000,000-gal. filtration plant.

A New Development in Steam Turbines

Converting a Combination of Helical Gears Into an Impact and Reaction Steam Turbine for General Commercial Application

By arranging to deliver steam against a central point of a pair of double mating helical gears and allowing the steam to hit the so-called spiral teeth of the gears by impact and to expand gradually in the tooth spaces as the gears revolve, the Buffalo Forge Company, Buffalo, N. Y., has developed an unusually interesting prime mover. The commercial promise of the resultant steam turbine is encouraged by an actual experience of three years with it and by tests of its steam consumption. It is at present placed on the market for a range of sizes up to 50 hp., but the machine studied during the process of development was one of 185 hp. employed for driving fans, gas scrubbers and other apparatus, and it is understood that patterns are being rapidly completed to bring out turbines of this general type of a capacity as high as 300 hp. The impression is early gained with regard to the size of the machine in relation to its capacity that it is notably small, and some indication of this fact may be gained from an accompanying reproduction of the photograph of a 5-hp. turbine behind which, incidentally, sits the inventor, J. H. VanDeventer, superintendent of the Buffalo Forge Company, with one of the gears or rotary members or runners in his hand. The turbine has been given the name Spiro, a name somewhat descriptive of its peculiar design.

An accompanying drawing is presented to indicate the meshing of the two runners of the turbine and in a separate drawing the connection bringing the steam to the teeth of the gears. The two views are shown separately so as not to confuse. An interesting point is that outside of the two meshing runners the turbine includes merely a casing and two end plates or heads which carry the bearings. In these the runners are mounted on ball bearings. The steam nozzle has a bifurcated terminal, but it is mentioned that a divergent form of outlet passage was not necessary because the steam velocity does not exceed 600 ft. per second. The initial action, it is explained, is impactive and the steam jet is diverted to the general direction of rotation. The jets impinge against the angular pockets formed by the junction of the left and right-hand helical teeth with resultant pressure drop and corresponding turning moment depending in amount on the rotative speed and the initial pressure. The remaining available energy of the steam is used expansively in the tooth spaces and it is stated that the ratio of expansion in present practice varies from a ratio of 1 to 3½ to one of 1 to 6. Several minor reactions, interesting from a thermodynamic standpoint, have been studied by the engineering staff of the Buffalo Forge Company, and, though these are regarded as of no practical importance, they act to promote turning moments in the same direction as the impactive and expansive action.

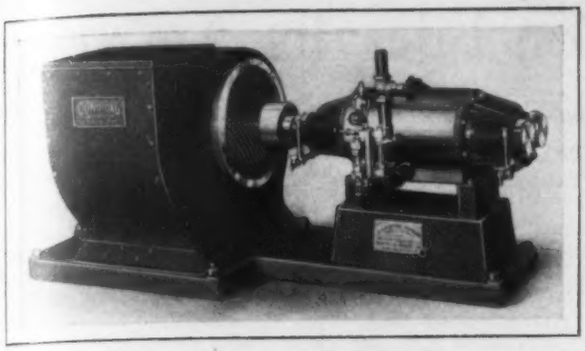


Sketch Showing Point Where Steam is Admitted to the Teeth of the Runners and Nozzle for Directing the Steam

A 5-hp. Spiro Steam Turbine and the Inventor, J. H. Van Deventer, Holding a Runner in His Hand

One of the illustrations shows a 10-hp. Spiro turbine direct connected to one of the company's recent productions, a 25-in. Conoidal fan built to furnish forced draft for a 300-hp. boiler. This view gives an idea of the general appearance and proportions of the turbine, which can of course be direct connected to an electric generator or can drive shafting by means of belting or otherwise serve where a prime motor is needed. In an accompanying table is given the results of recent tests, which are calculated to show the competitive value of the turbine with the reciprocating engine of corresponding size. It is explained that in rating turbines an initial steam pressure of 100 lb. is employed, such a pressure representing that under which small-sized turbines are required to run.

Structually there are two points which may be mentioned. One is that the teeth of the gears are cut from the solid by special machinery, so that there are no loose or inserted blades. The other is that the turbine in running makes no noise except a slight hum similar to that of an electric motor. It appears that tests have shown that a film of steam cushions the teeth of the runners at



A 10-hp. Turbine Shown Direct Connected to a 25-in. Conoidal Fan

all times so that there is an absence of metal against metal, although it would seem otherwise on first consideration.

Tests of the Spiro Turbine.

Test	1	2
Boiler pressure, lb.	120	130
Initial pressure, lb.	101.5	115
Horsepower	25.3	151
Speed, r. p. m.	2,450	2,710
Water per brake hp., lb. (non-condensing)	53.2	31.8

In the bearings the lubricating system is designed so that each bearing acts as an individual oil pump, circulating oil through the bearing between shaft and bushing, with a positive pressure.

Finally, a striking example of the power developed in a small space is furnished by a line of air drills embodying the Spiro turbine, which the Buffalo Forge Company has been developing, and which are shortly to be put on the market. A ¼-in. drill will penetrate hard cast iron 1 in. thick in 12 sec., or at the rate of 5 in. per minute. To drill iron at this rate requires over ¾ hp., and the rotors may be held in the palm of the hand.

Boiler, Tank and Stack Specifications

Under the direction of Col. E. B. Meier, president American Boiler Manufacturers' Association, a circular letter is being sent to boiler, tank and stack manufacturers by F. B. Slocum, secretary of the Supplymen's Association, Continental Iron Works, Brooklyn, N. Y., from which the following extracts are taken:

"As legislation is about to be taken in several of the United States and a number of provinces in Canada, it behooves boiler, tank and stack manufacturers, as well as the manufacturers of material used in the construction of these several lines, to take cognizance of the coming convention of the American Boiler Manufacturers' Association in New Orleans, La., March 12 to 15, inclusive, at which time an effort will be made by the A. B. M. A. to take up and decide upon uniform specifications.

"This organization has always stood for practical laws to protect the public as well as honest and conscientious boiler manufacturers. Its first action in 1889 was to establish the specifications for boiler steel and their material and construction which have become the standard by the general concurrence of manufacturers and engineers. Its efforts to pass uniform laws in various States have proved futile, and an educational campaign was resolved upon in 1898, and the association in convention at St. Louis unanimously adopted the uniform American specifications. These have been utilized by engineers and builders in stating their requirements.

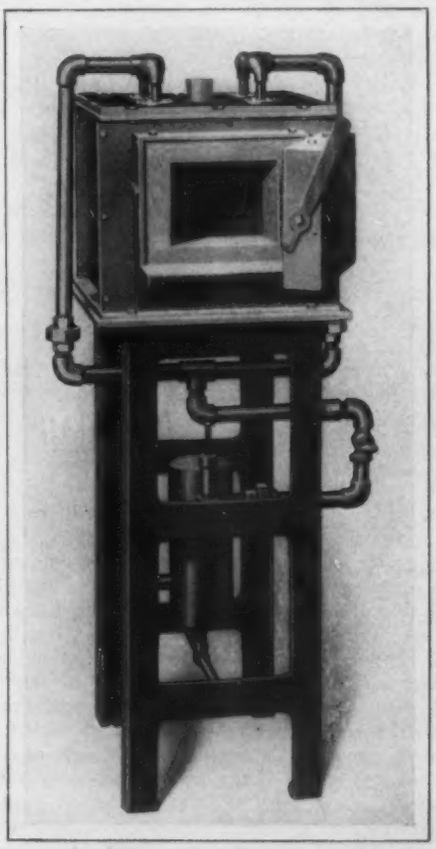
"In 1907 Massachusetts adopted a code of boiler rules in general consonance with these specifications. This code has been adopted by several States since, and is likely to be very generally enacted throughout the country. It is important that any imperfections or crudities in these rules should be frankly criticized by practical boiler manufacturers, with a view to perfecting the code and eliminating the effects of unjust or ill-considered legislation.

"Any individual or firm in one State would be at a disadvantage in combating an unfair bill, but deliberate and carefully considered indorsement of fair rules, or equally emphatic condemnation of unfair or extreme requirements by a body such as the A. B. M. A., with its prestige of a quarter of a century working in these lines must and will have great weight with intelligent legislators everywhere."

The Simplex Gas Forge

For forging and hardening lathe, planer and boring tools made from carbon and high speed steels the Simplex Tool & Supply Company, 125 Purchase street, Boston, Mass., has recently brought out a new type of gas forge. Among the advantages claimed for this forge are ability to watch the tool constantly, a clean output, fusing of the tool nose is eliminated, time is saved in performing the forging and hardening operations and an increased tool efficiency is secured.

Hitherto gas furnaces have been employed for hardening milling cutters, drills, reamers, etc., but a different type of furnace had to be used for lathe and special tools. Soft coal has formerly been employed as fuel in the furnaces and at a temperature of 2250 deg. F. the pores of the steel are opened with the result that sulphur and impurities from the fire are absorbed and in service the tool shows a decrease in efficiency which in some cases is said to be as high as 50 per cent. In addition to being



A New Type of Gas Forge for Forging and Hardening Built by the Simplex Tool & Supply Company, Boston, Mass.

used in a tool hardening room these forges can also be installed in railroad repair shops, since their capacity is sufficient to enable them to take the largest sizes of tire turning tools.

The following table gives the principal dimensions and specifications of the forge:

Inside hight, in.	8
Inside width, in.	10
Inside depth, in.	16
Width of entrance, in.	8
Hight of entrance, in.	6
Hight of entrance from floor, in.	40
Number of burners	4
Gas consumed per hour, cu. ft.	100
Air pressure required, lb.	1½
Floor space, in.	36 x 30
Weight, lb.	500

The George M. Newhall Engineering Company has removed its general offices to 807-8-9 Morris Building, 1421 Chestnut street, Philadelphia, Pa. This company prepares designs for and superintends the construction of manufacturing plants. It also specializes in steel rails and track material, carrying large stocks of relaying rails in its storage yards. It further conducts a supply department for furnishing cranes, testing machines, steam specialties, etc.

The Steel Corporation Files Its Answer

It Tells Why and How It Was Organized, Denies Monopoly in Steel and Control of Ore Supply and Shows How Competition Has Grown

A joint and several answer was filed January 31 in the United States District Court at Trenton, N. J., by the United States Steel Corporation and its various subsidiary companies to the petition filed by the Government October 26, 1911, under the Sherman Anti-Trust act. The following individuals join in the answer: J. Pierpont Morgan, Elbert H. Gary, Charles M. Schwab, Charles Steele, Henry C. Frick, James Gayley, William H. Moore, James H. Moore, Percival Roberts, Jr., Daniel G. Reid, Norman B. Ream, George W. Perkins and Peter A. B. Widener. The answer is signed by Lindabury, Depue & Faulks as solicitors and by Joseph H. Choate, John G. Johnson, Francis Lynde Stetson, David A. Reed, Raynal C. Bolling and Richard V. Lindabury as counsel.

The answer defends the organization of the subsidiary companies, denies that they were formed in violation of the Anti-Trust act, claims that they were a normal and necessary development of the times and insists that instead of restraining they have developed and increased trade and commerce.

Why the United States Steel Corporation Was Organized

The answer says that the organization of the Steel Corporation "was suggested and induced by the officers and directors of the Federal Steel Company; that this company, although largely integrated, was without finishing mills for sufficiently diversified products or sufficient capital either to build or to acquire them and was restricted in its growth by reason of its inability to compete effectively for business in the eastern part of the United States or in many foreign countries, owing to the location of its mills and the cost of transportation; that while its officers and directors were considering the matter of increasing its capital so as to enable it to acquire finishing mills, and thus complete the scheme of integration in pursuance of which it had been organized, they learned that the principal owners of the Carnegie Company were desirous of selling the business which they had established and of retiring therefrom; that about the same time they learned that the owners of the American Steel & Wire Company were willing to sell their properties with the substantial foreign business which they had established; that the Carnegie Company possessed a number of finishing mills of the kind required by the Federal Company to increase its variety of finished products, and the Carnegie mills were well located to supply steel products to all the eastern parts of the United States and to foreign countries; that the Federal Company had no wire, tin plate, steel hoop, sheet steel or tube mills whatever; that upon receipt of said information negotiations were opened through J. P. Morgan & Co. with the owners of the Carnegie Company, the American Steel & Wire Company, the American Tin Plate Company, the American Steel Hoop Company, the American Sheet Steel Company and the National Tube Company looking to the acquisition of their respective properties; that all of said properties were well suited and well located for the purposes which the officers and directors of the Federal Company had in view; that the owners of the Tin Plate, Steel Hoop and Sheet Steel mills refused to sell them unless the National Steel properties, which they also owned, were included in the purchase; that as the result of such negotiation offers were obtained from persons controlling a majority of the stock of each of said companies and after due and careful consideration they were accepted and the Steel Corporation was formed to take over the stocks covered by said offers and such other stock of the same companies as it might be able to obtain at the same price; that shortly after the Steel Corporation was formed it became apparent that said corporation would need additional ore supplies and transportation facilities and thereupon negotiations were opened with the owners of the Lake Superior Consolidated Iron Mines which resulted in the acquisition of the properties of that company that all of said properties were acquired for the lowest and best price obtainable; that the purchases thereof were negotiated at arm's length and that said properties as a whole were fairly worth to the Steel Corporation the price which it paid therefor.

"That the officers and directors of the Federal Steel Company had learned by experience that greater economies could be effected by integrating the plants and processes employed in the manufacture of steel and by increasing the diversity of steel products than they had anticipated when the Federal Company was formed or had yet been able to effect on account of the incompleteness of the integration of the Federal plant and the want of finishing mills for manufacturing a diversity of products; that they had also learned that foreign commerce in steel products could be much more successfully carried on by a company with sufficient capital and facilities to manufacture on a broad scale substantially all the finished products of steel and put them down in foreign markets in large quantities and at prices and in condition which could not be bettered by the great producers of other countries; that it was to effect such integration and diversification and the economies resulting therefrom, and to reach the principal markets of the United States and of foreign countries and increase the trade in steel products therein, that the Steel Corporation was formed and its properties acquired; that if any of the companies acquired by the Steel Corporation had been organized for the purpose or with the effect of restraining trade or commerce, or if they constituted an attempt at monopoly or a monopolization of trade or commerce, neither the organizers of the Steel Corporation nor the said corporation had any knowledge or information thereof when the said companies were acquired; that said companies had been in existence for a number of years; that their organizations were known to the public and the officers of the United States Government and had never been challenged in any way, and that they were purchased by the Steel Corporation in entire good faith, simply because the properties they owned were suitable for the purposes of the Steel Corporation.

No Monopoly and All Acts in the Open

"That said purposes substantially as herein stated were made public at the time they were formed, in many speeches, circulars, newspaper articles and official reports, as was every detail of the organization of the Steel Corporation; that the attention of the officers of the United States Government was particularly directed to said organization at the time it was effected and they have since examined into it again and again, sometimes with great fullness and at great length, but that never until within a few months, so far as these defendants are aware and as they believe, has any department or responsible officer of the Government criticized the said organization as being in either its purpose or effect a combination in restraint of trade or commerce or a monopoly or an attempt at monopoly; that in the meantime in good faith and with great publicity the Steel Corporation has pursued the objects and only the objects for which it was organized as then and hereinbefore declared; that full and accurate reports of all its operations have been made each and every year since it was organized and said reports have been furnished to the government and published to the world; that it has cheapened the production of steel to the consumer, has extended the home market for steel products and has increased its foreign trade in said products by natural development from $8,000,000 in 1901 to $60,000,000 in 1911; that the foreign trade thus created by the Steel Corporation constitutes upward of 90 per cent. of the total export trade of the United States in said products; that it has not suppressed competition, restrained trade or effected a monopoly in any of the products of steel or attempted so to do; that the number

of competitors of the Steel Corporation in the United States has largely increased since 1901 and that the output of said competitors has increased from approximately 40 per cent. in 1901 to upward of 50 per cent in 1911.

Wide Distribution of Stock

"That not only has the Steel Corporation gone on for ten years without objection from the Government and in the belief that its organization and practices were in conformity to law, but that in the meantime its stock has been sold several times over and the same is now held by a multitude of small investors in this and foreign countries who purchased the same in entire good faith, not doubting the legality either of its issue or of the corporation which issued it; that of these holders 35,230 are registered as common stockholders and 67,113 as preferred; that of the holders of the common stock 31,063 or 88 per cent., and of the preferred 62,199, or 92 per cent., hold not more than 100 shares each. That much of the remainder of the stock has been issued and registered in the names of persons or firms who hold the same in trust for others and have issued certificates in evidence thereof; that the number of such certificate holders is probably fifty thousand, making the actual number of the beneficial owners of the stock about one hundred and fifty thousand; that among the registered holders of the Corporation's stock are over twenty-two thousand of its employees, and that eight thousand of such employees in addition are subscribers therefor."

The defendants submit "that after acquiescing in the organization of the Steel Corporation for so long a time and after rights of so sacred a character have grown up thereunder, it is now too late for the Government to insist in a court of equity that such organization was in itself and without regard to its after practices an illegal thing."

The Great Northern Ore Lease

As to the Great Northern ore lease, the answer says "that the purpose of the Steel Corporation in taking said lease was simply to secure for itself an iron ore reserve adequate to its legitimate business needs; that said lease was not sought by the Steel Corporation but was offered to it by the persons controlling the properties covered thereby; that there was a division of opinion among the directors of the Steel Corporation as to whether or not said ores were needed by the corporation, and also as to whether or not the royalties asked were reasonable; that after much consideration it was decided by said directors to accept said offer, provided an option could be obtained which would entitle the corporation to surrender the lease in 1915 should it desire so to do, it being thought that by that time a better judgment could be formed upon both of said questions; that said option was conceded by the proposers of the lease, and that thereupon the lease was accepted," and "that in the exercise of the option so given and in pursuance of its terms the Finance Committee of the Steel Corporation on October 17, 1911, and the Board of Directors on October 26, 1911, resolved to cancel and surrender said lease on the first day of January, 1915, and thereupon caused notice to that effect to be given to the lessors."

The Tennessee Coal, Iron & Railroad Company Purchase

The answer says that the proposition to purchase a majority of the stock of this company came from Grant B. Schley "and was not induced or contrived by any act of the Steel Corporation, its officers, directors or friends, and after being rejected by the officers of the Steel Corporation was again taken up on account and only on account of the representations made on behalf of said Schley that nothing but such purchase would save Moore & Schley from failure, and the urgings of bankers and financiers that the failure of Moore & Schley might so extend the panic as to involve the business of the Steel Corporation and every other business interest of the country in incalculable loss and injury.

"That being in doubt as to the attitude of the Government with respect to the said proposed purchase, Messrs. Gary and Frick of the Finance Committee of the Steel Corporation went to see the President of the United States on November 4, 1907, and laid the situation before him." The answer denies "that Messrs. Gary and Frick failed to disclose to the President all the facts bearing upon the proposed purchase or the occasion for making the same which were pertinent thereto, or that they made any misstatement or misleading statement of any sort or character to the President regarding the financial situation in New York or regarding the wishes or attitude of themselves or the Steel Corporation with respect to the proposed purchase." It admits "that the President stated that he did not feel it to be his duty to prevent the proposed transaction" and says that "in reliance upon said statement Messrs. Gary and Frick returned to New York, whereupon the purchase was completed." It denies "that in the purchase of the Tennessee Company there was a a desire or purpose to remove a competitor either present or future." It denies "that the known commercially available coal and iron deposits of the United States have been almost entirely acquired by manufacturing companies for the purpose of development." It says "that approximately one-half of the iron ores of the United States now commercially available are owned by private individuals and are for sale to any manufacturing companies or others desiring to purchase the same." It denies "that the Tennessee Company was a strong present or probable future competitor of the Steel Corporation at the time of its acquisition by the latter," and says "that the production of steel by said company at the time of its acquisition was less than 1.7 per cent. of the total output of the United States; that its growth had been slow and the growth of the Southern demand for its products had likewise been slow, and that as a competitor it was insignificant compared with many Northern independent companies.

HIGH RAIL COST OF TENNESSEE COMPANY

It admits "that in 1907 certain railroad companies, in which E. H. Harriman was interested, had placed an order with the Tennessee Company for about 157,500 tons of open hearth steel rails at $29 per ton or $1 more than the prevailing price of Bessemer rails," but denies "that this order at once put the Tennessee Company into the position of an actual competitor of the Steel Corporation" and denies that "as a competitor it was 'of great potentiality.'" It says "that the cost to the Tennessee Company of producing the rails to fill said order was over $30 per ton and that the first shipments of rails under said order by the Tennesee Company were so defective that the Steel Corporation, after it acquired the stock of said company, was compelled to replace a large part of the same."

No Monopoly in Iron Ore

The answer denies that "the holdings of the Steel Corporation of commercially available ores exceed those of all other iron and steel interests combined." It says that of the presently available ores of the United States the Steel Corporation owns or controls less than 40 per cent., while on the ores of Cuba and other foreign countries, upon which the cost of transportation is sufficiently low to enable such ores to compete with domestic ores, the interests of the Steel Corporation are less than 10 per cent." It admits "that at the present time the ores of the Lake Superior region are very important in the steel industry," but says "that an abundance of commercially available ore is obtainable at many other points in the United States." It denies "that of the ores in the State of Minnesota the Steel Corporation controlled at the time of the filing of the petition not less than 75 per cent." and says "that after the surrender of the Great Northern ore lease, and before the filing of the petition, the Steel Corporation controlled approximately only 60 per cent. of the ores in the State of Minnesota." It denies "that the Steel Corporation controls or has controlled 75 per cent. of the ore in the State of Michigan," and avers "that its control of Michigan ore at the time of the filing of the petition was less than 32 per cent." It also says "that in the States of New York, New Jersey, Pennsylvania, Virginia, Texas and Utah, where vast bodies of ores now commercially available are deposited, the interest of the Steel Corporation constitutes less than 1 per cent. and that of the vast deposits of ores in the Birmingham district of Alabama the Steel Corporation controls less than 30 per cent."

Competition Has Not Been Stifled

The answer says that "continuously since the organization of the Steel Corporation it has been the declared and consistently followed policy of said corporation to encourage rather than to restrain the utmost freedom of trade and commerce; to refrain from acts of oppression or injustice to the competitors of said corporation; to abstain from efforts to harrass such competitors or to exclude them from their fair share of interstate or foreign commerce, and to take no steps intended or calculated to prevent the growth of other and further competition, and that such policy has been well known throughout the industry freedom and growth of competition have existed; since the organization of the Steel Corporation." It says "that without check or embarrassment from said corporation competition in the iron and steel business in the United States has constantly increased since the organization of said corporation, that throughout the whole industry freedom and growth of competition have existed; that the vast increase in capacity made by the companies controlled by the Steel Corporation has been insufficient to maintain its proportion of the iron and steel business of the country; that its average output has decreased from approximately 60 per cent. in 1901 to less than 50 per cent. in 1911, and that this has occurred notwithstanding the great increase in the Corporation's foreign trade, and notwithstanding the fact that this foreign trade which the Steel Corporation has created amounts to upward of 90 per cent. of the total foreign trade of the country in steel products."

The "Gary Dinners"

The answer says that "the first of said meetings was held on November 20, 1907; that the country was then suffering from a severe financial panic and that the steel manufacturers came together for mutual counsel and advice as to the best means of averting disastrous consequences to their industry such as had followed nearly every panic that had heretofore occurred in this country. That said meeting was largely attended! that there was a full exchange of information as to the condition of the various businesses represented, and a frank interchange of views with regard to the business situation; that similar meetings with similar objects followed, but that neither then nor at any other time was there any attempt to reach any agreement or understanding with respect either to output of prices, nor was anything said or done which was calculated or intended to suppress competition or restrain trade, and there never was nor is there now any such agreement or understanding. That said meetings resulted in allaying much of the suspicion and distrust which had previously existed among the steel manufacturers with respect to the purposes and practices of their competitors and in elevating the standard of ethics which had prevailed among them; that these meetings did not prevent frequent changes and fluctuations in prices or competition in steel products, but they did tend to prevent the misunderstandings and unfair practices out of which had grown nearly all the trade wars of the past."

The answer admits "that said meetings brought about among the steel and iron manufacturers a realization of the fact that they were 'traveling together' and that they ought to help and not to injure one another," and says "that the fraternal feeling so developed has been of inestimable benefit to the iron and steel industry and to the public at large; that owing thereto the steel and iron business and the business of the country generally have been steadied; that the weaker concerns in the steel and iron business have been able to continue therein; that the wages of employees in said business have been maintained, and that for the first time in its history the steel industry has passed through a severe financial panic without a single failure."

Not Violators of the Law

The concluding portion of the answer is as follows: "They deny that they have ever violated or attempted or intended to violate the Anti-trust act or any provisions thereof. And they particularly deny that they are now engaged in violating said act or are threatening or intending to violate the same, and they respectfully submit that in the absence of such present or threatened or intended violation this honorable court is without jurisdiction to grant the relief prayed for in the petition or any part thereof or any other relief in the premises, and they pray to be hence dismissed."

Direct Representation of American Machinery in Europe

The special European representative of a large American machinery building company recently wrote his principals as follows:

"I believe that no permanent or successful representation can be made in the various Continental countries through commercial agents who are handling anybody's and everybody's machinery. Other American exporting firms have endeavored to follow these lines and in every case have met with failure. The London manager of one of the successful American concerns in doing business over here personally told me that wherever, in the early attempts to enter this market, they tried to work in such countries as Germany, France, etc., through agents they signally failed and the market was lost to them. They now conduct their business through their own offices, which are quite extensive and are laid out on the same lines as their American offices, with the result that their business is now exceeding $2,500,000 per annum.

"It should be self-evident that a European agent, while he may know the language of the country and while he may know the general line of business, cannot have the intimate knowledge of our material required and has never been able to compete with direct local representation or local manufacture. In dealing with an agent one can never be certain that our line is being pushed, or know that the agent is not representing other similar lines, or even, in the case of successful negotiations, whether any cut in price made did not go into the agent's pocket as extra commission, and was not required by the actual negotiation."

Growing Exports of Automobiles

Automobiles valued at $21,636,661, including tires and other parts, were exported from the United States in the calendar year 1911, or 20 times as much as a decade ago. The exports to our own non-contiguous territories—Hawaii, Porto Rico and Alaska—were $1,843,165 in addition. Ten years ago the exports to foreign countries were but $1,069,782 in value; by 1906 they had grown to $4,409,186; by 1910 to $14,030,226. This increase of $20,000,000 in the exports of American-made automobiles within a single decade is one of the most notable achievements of our foreign commerce in recent years.

Meantime imports of automobiles into the United States show a decreasing tendency. From 1902 to 1906, before the industry had developed in this country, imports rapidly increased, from about $500,000 to $5,000,000, the high record in imports of this class of vehicles. Since 1906, however, the imports have steadily decreased, last year's total having been but $2,446,248. In 1906, according to the published reports of the Bureau of Statistics, Department of Commerce and Labor, imports and exports of automobiles were of about equal value, imports into the United States in that year being $4.910.208 and exports therefrom $4,409,186. The following year witnessed a shifting of the balance of trade in automobiles from the import to the export side.

The North Buffalo Railroad Company has been incorporated at Buffalo, N. Y., by T. H. Wickwire, Jr., H. T. Dunbar and H. D Miles, to build an industrial or internal plant railroad at the Wickwire Steel Company's plant on the Niagara River, north of Buffalo, with a connecting line to Tonawanda. The railroad company has a capital stock of $100,000.

The Pioneer Iron & Steel Company, Sand Springs, Okla., has been incorporated with $75,000 capital stock by Ben F. Rice, Tulsa, Okla., and J. H. Kerwin, Gary, Ind., for the erection of a rolling mill. It is stated that the machinery for the mill has been ordered. Samuel E. Light is to be general manager.

Normandy Iron Ore

Consul James E. Dunning, Havre, France, furnishes a report on the iron ore deposits in lower Normandy for the Bureau of Manufactures, Department of Commerce and Labor, which is published in the Daily Consular and Trade Reports of January 26. From this report the following extracts are taken:

Normandy iron ore is sold by the mines on a basis of 50 per cent. of iron and 12 to 14 per cent. of silica in dried ore, with a deduction of 5 per cent. for water in ore fresh from the mines. The basis prices normally range from $1.83 to $1.93 per ton. The cost of transportation from the mines to Caen is as follows: From St. Andre or Maysur-Orne, $0.2509 per ton; from Soumont, $0.5076; from St. Remy, $0.4825; from Larchamps, $0.8878. The ore is discharged on the ground at Caen, as no means have been provided for direct embarkation, and is then loaded on the boats by private companies, who receive 1 franc ($0.193) per ton. A chamber of commerce tax of $0.0193 per ton is also imposed. The boats return to Caen with Welsh or Newcastle coal, or freight from the English coast, the boats from Rotterdam coming by that route. German coal is imported to only a small extent, about 70,000 tons per annum. Caen has risen to eighth place among the French ports in the total tonnage of its shipments, the imports in 1910 being 574,624 tons and the exports 326,050 tons. In 1900 the total tonnage was 568,150 tons. This rapid growth is due almost entirely to the imports of coal and the exports of iron ore. From 224,251 tons in 1890 the coal imports of the port rose to 486,537 tons in 1910, and the iron-ore exports rose from 43,469 tons to 306,404 tons in the same period. Rotterdam takes over two-thirds of the iron ore exported.

The average freight rate from Caen to Rotterdam, for iron ore, was $0.965 in 1910, and to English and Welsh ports about $1.0229 per ton. The rates on coal from England and Wales were $1.05 to $1.20 per ton. Transshipment of ore to the canal boats at Rotterdam costs about $0.0965 per ton, canal haulage to Ruhrfort is $0.2895 per ton, and discharging at that place $0.0965 per ton. This makes the total cost of the ore at the Ruhrfort smelting works as follows: Cost at mine, $1.83; freight to Caen, $0.25; loading and registration tax, $0.21; freight to Rotterdam, $0.965; transshipment, $0.097; canal freight to Ruhrfort, $0.2895; and discharging, $0.097—a total of $3.74 per ton. In Germany the railroad freight from Ruhrfort to the Essen-Bochum group of smelters is $0.2895 per ton and to the Dortmund group $0.6755 per ton.

Cuban Government Scrap Sale

The Havana Post, Havana, Cuba, of January 19, states that Nathan S. Stern, New Orleans, was the successful bidder for scrap iron and bronze scattered over the island and offered for sale by the Cuban Government. The successful bid was $3.55 currency per ton for the iron and $136.10 per ton for the bronze. The quantity of old metal thus available, including old and useless guns and wrecks of ships around the coast, was estimated some years ago at about 8000 tons, but the amount now available is variously estimated from 3200 tons to 5000 tons. An attempt was made to sell this material about a year ago, and at that time German Lopez, representing Charles W. Benjamin, was awarded it at $1.50 per ton for the total iron and bronze, but the contract was annulled as a result of agitation by Cuban newspapers over the very low price named. Some complications may arise over the new contract regarding old cannon at Santiago de Cuba included in the sale. Several pieces were given to the city by Gen. Leonard Wood when he was military governor, because of historic associations connected with them.

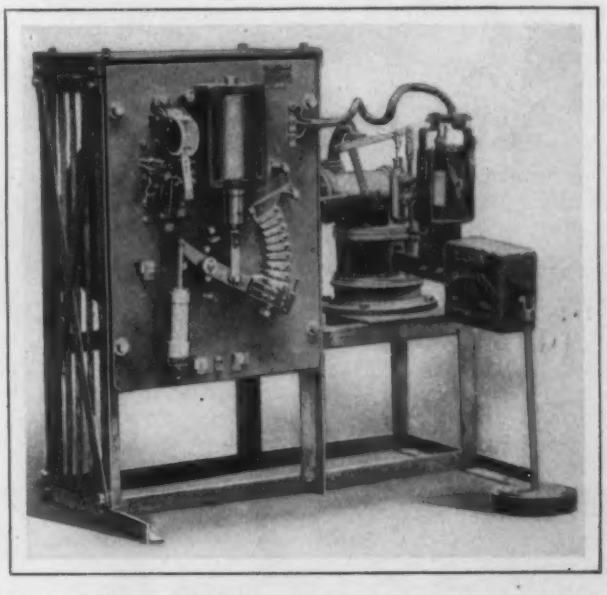
The Bureau of Statistics, Department of Commerce and Labor, Washington, D. C., has issued a large sheet giving the sailing dates of steamships from ports of the United States to ports in foreign countries for the month of February, which is compiled from information furnished by the various steamship companies. Copies may be obtained free of charge on application to the bureau.

Automatic Elevator Pump Controller

Interesting data have just been made public by the Cutler-Hammer Mfg. Company, Milwaukee, Wis., on the results of the first installation of a new automatic pump controller for hydraulic elevator service. The controller is intended to do away with the trouble frequently encountered during rush periods by hydraulic elevator systerms by varying tank pressure. This installation was made at Rochester, N. Y., where a motor-driven rotary screw pump was formerly used. This pump, it is stated, was unable to maintain the proper pressure and used an enormous amount of current.

One of the engineers of the Rochester Railway & Light Company suggested that a triplex pump driven by a 13-hp., 220-volt motor and equipped with this pressure controller be substituted. When the demands on the elevator are light the pump motor runs at its slowest speed, but as the traffic grows heavier the speed is increased and more water is pumped to meet the requirements. As a result of tests made on this installation the power consumption is said to have been reduced from 4300 kw.-hours to 1950, a saving which amounts to about $600 per year.

Other advantages of using the controller from the point of the company supplying the power are that a smaller motor can be used to drive the pump and that



A New Self-Starting Automatic Pressure Regulated Pump Controller for Hydraulic Elevator Service Made by the Cutler-Hammer Mfg. Company, Milwaukee, Wis.

the maximum amount of power required to supply the service is less than if the pump were allowed to run at full speed until the maximum pressure in the tank was obtained, an arrangement which also enables the customer to secure a much better rate for his power. Another advantage of this arrangement is that the pump would run more continuously and consume less energy per gallon pumped than if it were allowed to start and to stop frequently. Where the current supplied to the pump motor is generated on the premises a controller of this type should find a useful application in cutting down the heavy intermittent demand for current and less generator capacity would be required to supply the current for this service.

Owing to its fast increasing business in Louisville, Ky., the H. W. Johns-Manville Company has found it necessary to move its offices from the Lincoln Savings Bank Building to 205 Paul Jones Building, where spacious quarters have been secured. The office will be in charge of J. R. Chowning, who has traveled in that section from the Milwaukee office for a considerable time. A complete line of J-M asbestos and magnesia products, electrical supplies, packings, pipe coverings, roofings, etc., will be handled from that office.

The Rock Island Arsenal Labor Trouble

Lack of Tact Shown by Officials—Labor Leaders Wrongly Accused—Not a Test of Scientific Management

BY MAX H. C. BROMBACHER*

As regards the trouble at Rock Island Arsenal, hearings have been held at Washington, D. C., in the room of the Committee on Labor, beginning January 4 and extending to January 22. Some testimony in reference to the Navy Yard at Norfolk has been taken. Specific comment on the evidence drawn out at these hearings is precluded by the fact that, unlike the hearings at Boston and New York, the only record of testimony is the official one which was at all times in charge of the stenographer; at the former hearings each member of the committee had daily on his desk a copy of the testimony taken the previous day.

About the most interesting thing developed about the situation at the Rock Island Arsenal was that piece work rates had been cut there several times. It appeared that the earnings per diem of the men had averaged the same after the cuts as they had before. Unfortunately, although this had happened some years ago, it gave the operatives cause for thinking that even the Government was not above resorting to the "rate-cutting mania"; it certainly could not be construed as making baseless the fear of the men that it would be the same thing under scientific management.

A Peculiar Indorsement on a Workman's Card

A bit of testimony was brought out in reference to the attitude of the officials at that Arsenal which evidences a peculiar view of the opinion which officials have in respect to the right of the operatives under them. It seems that one of the men there had a fine card as regards his rating in respect of efficiency, attendance, etc., but when he resigned his place in the shop to take charge of a district for his labor organization, the official indorsement on the back was made that he was a trouble maker. Now, it is beyond cavil that everyone about the arsenal knew that the man was an ardent unionist, that he was perhaps a union organizer, and the writer has yet to see the first person who was or is ignorant of the fact that a large number of the operatives in the arsenal were unionists; it would, therefore, appear that his "trouble making" must have consisted of conducting a propaganda for his organization.

On the other hand, if he did this in the Government's time, or if his doing it affected unfavorably the Government's interests or the morale of the shop, the first question which presents itself to the lay mind is, Why was he not dismissed? Next, how in the world did he get such a fine card as regards efficiency, etc., from the officials? Another question is, Does not so fine a card in these essentials show the indorser of the other side of the card in a most peculiar light, entirely apart from the evident maladroitness of the official who did or who permitted the indorsing? It was common knowledge, even here in the East, that the operative resigned to take charge of the Washington district, including the navy yards; hence, what the arsenal officials did for him was to send him East with a martyr's crown in the eyes of his fellow unionists.

General Crozier's Testimony

The writer had the pleasure of hearing some part of the testimony of General Crozier, who was on the stand about two days and a half, commencing January 16 and ending January 18. One cannot but be impressed with the fact that he is a very intelligent, broad and fair man, and that he has a great deal of tact. Had the Watertown Arsenal and the Rock Island Arsenal a duplicate of General Crozier at their respective heads the present trouble would have been very much minimized, if not entirely avoided. As it is, with the exception of the testimony given by the general, and the excellent impression which his personality made on the committee and the labor leaders alike, the testimony taken in regard to these two arsenals in respect of methods attempted in the application of scientific management would go far toward justifying a recommendation from the committee placing the manufacturing activities of the Government in charge of civilians instead of military and naval officers.

In the opinion of most people conversant with the facts in regard to the situation in the arsenals and navy yards generally, and with the facts in regard to the labor situation at large. General Crozier made a serious mistake at the close of his testimony by the remark, in effect, that the trouble among the men in respect to the application of scientific management had been caused by the labor leaders "who see that their usefulness to the men is gone in view of the fact that the men can get these large earnings" without their leaders' help.

Labor Leaders Wrongly Accused

In the first place, the evidence at the Watertown Arsenal showed conclusively that the strike originated with the molders and was an accomplished fact before even their district organization knew anything about it. Second, it is within the writer's knowledge that the Rock Island operatives took a strike vote which was practically unanimous. Third, the Washington troubles, like the Rock Island Arsenal troubles, were in leash by the leaders. And to take a similar instance, though in a railroad shop, the writer knows of a very late case in which a shop committee informed the district leader that, barring his obtaining for the men certain demands (not wage), they would go out. The district leader told the men on the committee that the Grand Lodge was not in shape to finance a walk out, to which the men replied that, nevertheless, he was to get their demands or they would walk out. Now, all these instances are cumulative in respect of the trouble being made for the leaders by the men, not by the leaders for their own interests.

Now, the basic fact which is to be remembered when approaching the consideration of the labor question in an attempt to get its angle of view in respect of any system of shop management whose basic principle is that "per capita production is the criterion of the wage rate" is that a large majority of every labor organization is composed of those whose limitations in respect of ability cause them to cling to the minimum rate. It follows that these men do not need to be told that the success of their minimum wage rate is imperiled by the attempt to introduce to them the formula that "per capita production is to be the basis of the wage rate." It seems to the writer, therefore, that one need look no further than this basic fact to account for the uprising against scientific management in the Government arsenals and elsewhere, since the great bulk of these operatives are unionists, with the larger pay and shorter hours than are generally paid in private concerns.

Two Kinds of Labor Leaders

The writer's experience has taught him that, if a labor leader has been a minimum rate earner, the manufacturer or efficiency engineer is warranted in looking for breakers; the leader will sympathize with and fight for the maintenance of the minimum rate. But, on the other hand, if the labor leader has earned as a mechanic more than the minimum rate, then the manufacturer or efficiency engineer can rest assured that the leader is intelligent, sees the other side of the case as well as his own, and, within limitations, is willing to give the idea of "per capita production the criterion of the wage rate" a hearing. Now, one of these limitations is that he must be satisfied that the boss or engineer knows his business; the second is that he must feel satisfied that the boss or engineer means to be fair; the third is that the boss or engineer must

*Practical efficiency engineer, New York City.

have wit enough to know that the leader is not warranted in imperiling his position by insisting on trying to lead his followers further than they can be induced to follow him.

The writer is, therefore, among those who consider that the best interests of employers is not conserved by indiscriminate attacks on the motives of labor leaders; on the contrary, he is of those who believe that it pays to find out just what sort of labor leader one has to deal with. And, coming down to the case at bar, the writer knows that neither Mr. O'Leary nor Mr. Johnston is, as a mechanic, of the kind that are satisfied with the minimum rate; far from it. Hence, after the hearings in New York City, at which the writer had given testimony regarding really intelligent piece-work systems, he was not surprised to find them and their associates in accord with him. The writer, however, would not expect them to imperil their positions by indorsing his economic philosophy.

It is generally conceded by those conversant with the labor problem that any amelioration of the sharp line of cleavage existing in some quarters between employers and employed must begin with the labor leaders teaching their followers to see that there are two sides to the question. Obviously, if labor leaders are to be attacked indiscriminately, those of them who really see the evils inherent in their organization and are honestly desirous of bringing their followers "to a realizing sense" are hardly going to be heartened for work which is inherently difficult by encountering such attacks from employers or their agents at the very threshold of their work. On the other hand, nothing helps this class of labor leader so much as to have employers and their agents discriminate between intelligent, straight leaders and the other kind, be the latter merely incompetent and windy or be they crooked and malicious.

The McConnell Attack on Scientific Management

This leads the writer to a few remarks regarding the McConnell pronunciamento of last August on the perils to organized labor inherent in scientific management, however applied. This pronunciamento forms part of the basis for General Crozier's charge that the trouble in the arsenals is due to machinations of labor leaders. The fact is, as everyone at all conversant with labor politics knew at the time, that McConnell was a candidate for reelection as president of the International Machinists' Union by the convention which was to meet in Davenport, Iowa, the next month. He had been accused by an Erie Railroad official of having been on the Erie's pay roll for several years at a fat salary. The Erie Railroad cut him off the pay roll and a strike ensued. The Erie Railroad charged that the strike and McConnell's being dropped from the pay roll were in the nature of effect and cause respectively. It seems that an investigation made by labor officials could trace no Erie money directly to McConnell; on the other hand, Erie money was traced to one or more of McConnell's intimates, who, be it said to the credit of organized labor, were promptly dropped through the hatch.

McConnell's candidacy for reelection was, therefore, in the nature of what politicians call a campaign for vindication. His campaign, like so many similar political campaigns for this purpose, was a failure. W. H. Johnston, McConnell's competitor for the office, was elected by a handsome majority. All this happened before the hearings commenced at Boston; hence, it would seem as though ample time had elapsed in which almost anyone, army officers not excluded, could have learned the facts. What has been stated seems to indicate with a tolerable degree of certainty that the imminent peril which McConnell's address was so eloquent about was not any imminent peril to labor, but it was the imminent peril to his candidacy which was bothering him at that time; and, as matters eventuated, was bothering him with so much cause. Certainly at no time since the Davenport convention has McConnell evinced sufficient interest in the arsenal hearings to justify a charge that he was responsible for the trouble at either Watertown or Rock Island.

The Future of Efficient Management

A final word in reference to the future of "efficient systems of shop management" may not be out of place. It is far from the writer's intention to deny that prospects of efficient management have been dimmed and its headway retarded by the antics of some of its alleged friends and well wishers; and in these antics must be included some of the gems of thought contained in literature and addresses, perhaps intended to be construed as poetic imageries but taken unfortunately by the operatives to constitute apt similes of the place they were intended by these writers to occupy in the social scale when and if "scientific management" ever blossomed into the mature flower of performance. For one, the writer cannot find it in his heart to blame the operatives for their attempt to arrange matters so that "the inquest" should be performed while the matter was still only a bud of promise.

But, like unto religion and the eternal verities, its cause is just and in accord with nature's (economic) laws. It is wrong practice that has given it its temporary setbacks. These it will surmount in time, and it will then measure up to the requirements of the situation. It has got to go through the inevitable process of sifting the wheat from the chaff.

Noelke-Richards Iron Works to Buy Brown-Ketcham

Frank D. Stalnaker, trustee in bankruptcy for the Brown-Ketcham Iron Works, having plants at Indianapolis, Ind., and at Greensburg, Pa., has recommended to referee-in-bankruptcy Albert Rabb, the sale of the two properties to the Noelke-Richards Iron Works, Indianapolis. The recommendation has been approved by attorneys for the creditors. It is practically certain that the referee will approve, in which case Hugh R. Richards, president of the Noelke-Richards Iron Works, says the Greensburg plant will be started about March 1 and the Indianapolis plant as soon after that date as possible."

"The Greensburg plant will give us entrance to new territory." Mr. Richards says, "and we desire to get it going as soon as possible. Our contracts will keep our present plant busy for three months." The capacity of the three plants will be 65,000 tons a year, which will make the company rank well up among the largest fabricators of steel and iron structures. The valuation of the two Brown-Ketcham plants, as set by the old company, was $588,000. The plant at Greensburg was built in 1903 to care for contracts that might be most advantageously handled from the Pittsburgh district.

The Noelke-Richards Iron Works is capitalized at $200,000 and has a surplus of $80,000. It will issue $250,000 of first mortgage bonds, of which the creditors of the Brown-Ketcham Iron Works will take $125,000 and the banks and trust companies of Greensburg $50,000. The Noelke-Richards business was founded in 1872 by Frederick Noelke. The present company succeeded the Haugh-Noelke Company in 1902, being a consolidation of that company with the Indiana Ornamental Iron Works of Indianapolis. The officers of the company are: President, Hugh R. Richards; vice-president, F. H. Waterman; secretary-treasurer, Christian T. Blizzard; financial adviser, William J. Richards, director of the National City Bank of Indianapolis.

The Pratt Letchworth Company, Buffalo, N. Y., is preparing plans for a new malleable foundry, 225 x 550 ft. This building is not to be an enlargement, but will be erected to replace the old wooden buildings which have been added from time to time. Arrangements are being made to eventually equip the foundry with overhead cranes of I-beam trolleys for handling material, waste heat boilers and a hot air heating system. The building will be put up in sections to prevent interference with operations.

Matthew Addy & Co., Cincinnati, Ohio, have issued a circular calling the attention of the foundry trade to their manganese by-product, through the use of which the manganese in foundry mixtures can be secured at a minimum cost. This by-product analyses as follows: manganese, 10 to 12 per cent.; silicon, 0.45 to 0.55; sulphur, 0.025 to 0.035; phosphorus, 0.08 to 0.09. Its use gives strong castings that are easily machined.

Republic Iron & Steel Company

Report for the Six Months Ending December 31, 1911

The Executive Committee of the Republic Iron & Steel Company has issued its report for the six months ending December 31, 1911. The income account and statement of surplus for the six months, with comparison with the second half of 1910 are as follows:

	Six months, 1911.	Six months, 1910.
Net earnings from operations, after deducting charges for maintenance and repairs of plans, amounting to:		
December 31, 1911, $737,501.38	$1,470,813	
December 31, 1910, 680,630.27		$1,951,454
Interest and dividends received, less interest paid		40,956
Total profit for the six months	$1,470,812	$1,992,410
Less—		
Provision for depreciation and renewal of plants	$180,694	$300,168
Provision for exhaustion of minerals	122,008	133,511
	$302,702	$433,679
Net profit for the six months	$1,168,110	$1,558,731
Deduct—		
Interest on bonds	369,338	290,882
Net profit applicable to dividend.	$798,772	1,267,849
Add—		
Surplus July 1, 1911	5,362,446	
Surplus July 1, 1910		4,954,661
	$6,161,218	$6,222,510
Deduct—		
Dividends on preferred stock: Two quarterly dividends of 1¾% each	875,000	875,000
Net surplus carried to balance sheet.	$5,286,218	$5,347,510

The balance sheet December 31, 1911, is as follows, with comparison with December 31, 1910:

	December 31, 1911.	December 31, 1910.
Assets.		
Plant, etc	$64,151,273	$58,212,415
New construction in six months	1,343,865	2,688,496
Investments in other companies	930,852	942,385
Prepaid royalties, stripping, etc	832,954	894,524
Miscellaneous	.....	8,472
Inventories	8,100,692	6,956,570
Ore contract payments	524,454	599,582
Accounts and bills receivable	3,909,805	3,699,124
Cash	3,083,279	2,172,556
Cash with trustees for bond redemption	288,809	.....
Totals	$83,165,983	$76,174,124
Net current assets	$12,510,214	$11,090,852
Liabilities.		
Common stock	27,191,000	27,191,000
Preferred stock	25,000,000	25,000,000
First mortgage bonds	1,645,000	1,647,000
10-30-year sinking fund 5s	11,305,000	8,196,000
Haselton property mortgage notes	1,475,000	1,475,000
One year collateral notes	3,000,000	.....
Potter Ore bonds	314,500	325,500
Martin Coke Works bonds and notes	312,287	373,382
Accrued interest	178,234	139,421
Ore contracts	215,533	188,474
Accounts and bills payable	2,098,753	1,475,252
Reserve funds	*3,780,330	†3,343,461
Accrued taxes	175,250	93,587
Dividend warrants	748,632	938,290
Dividends accrued	437,500	440,246
Unclaimed dividends	2,746	.....
Profit and loss	5,286,218	5,347,510
Totals	$83,165,983	$76,174,124

*Includes fund for exhaustion of minerals, $1,516,388; for depreciation and renewals, $1,479,861; for relining furnaces, $256,975; for fire and accident insurance, $405,565; for contingencies, $121,541.

†Includes fund for exhaustion of minerals, $1,365,452; for depreciation and renewals, $1,224,130; for relining furnaces, $208,091; for fire and accident insurance, etc., $403,079; for contingencies, $142,709.

Developments of the Year

On the condition of business and the financial operations of the company Chairman John A. Topping says:

The gross volume of business for the six months ending December 31, 1911, compares favorably with best previous periods when greater market activity ruled, but the average prices for shipments made are the lowest for any period in the history of the company. The shrinkage in values indicated is the natural result of the restricted demand incident to disturbed conditions of general business. The increase in gross volume of business we obtained is due entirely to additions to our capacity and to greater diversity of products manufactured. Had it been possible to operate the works to full capacity a substantial increase in volume of business would have resulted.

All important new additions or extensions to works mentioned in previous reports have now been completed. The last of the improvements authorized were the 90-in. plate mill and the 14-16-in. continuous merchant mills, and these mills were placed in operation in the month of December, 1911.

Substantial reductions in costs were generally effected, and present operations reflect greater efficiency and lower costs than at any previous date in the history of the company. The net profits, however, show reductions as compared with a similar period for 1910, as a result of low prices naturally incident to conditions above stated. While full maintenance charges have been made, some reduction in depreciation charges was thought proper in view of previous liberal allowances on this account. All provisional funds, however, have been fully maintained. The net profits applicable to dividends are $798,772.31, and the net surplus as of December 31, 1911, is $5,286,218.16.

The Haselton Steel Tube Company notes amounting to $1,475,000, and guaranteed by this company, maturing April 15, 1912, the board of directors deemed it advisable to provide for the payment of these notes in advance of their maturity, as well as to provide for various construction contracts nearing maturity, by an issue of $3,000,000 one-year collateral notes.

The deductions from working capital on account of new construction during the six months ending December 31, 1911, increased the capital assets $1,343,865.19, leaving the balance of net working assets as of December 31, 1911, $12,510,213.86.

The statement of unfilled orders for finished and semi-finished products and for pig iron is as follows, with comparisons:

	Finished and semi-finished products. Tons.	Pig iron. Tons.
December, 31, 1911	414,431	158,392
June 30, 1911	481,425	102,077
December 31, 1910	293,734	76,378
June 30, 1910	341,887	82,906
December 31, 1909	457,785	39,995
June 30, 1909	392,420	94,247
December 31, 1908	391,040	89,934
June 30, 1908	283,743	59,196
June 30, 1907	448,627	74,500

In the totals of finished and semi-finished products nothing is included but fixed contracts; sliding scale contracts with periodical adjustments are excluded. The report says in conclusion that "substantial improvement in prices and market activity occurred during November and December, and the outlook is more encouraging."

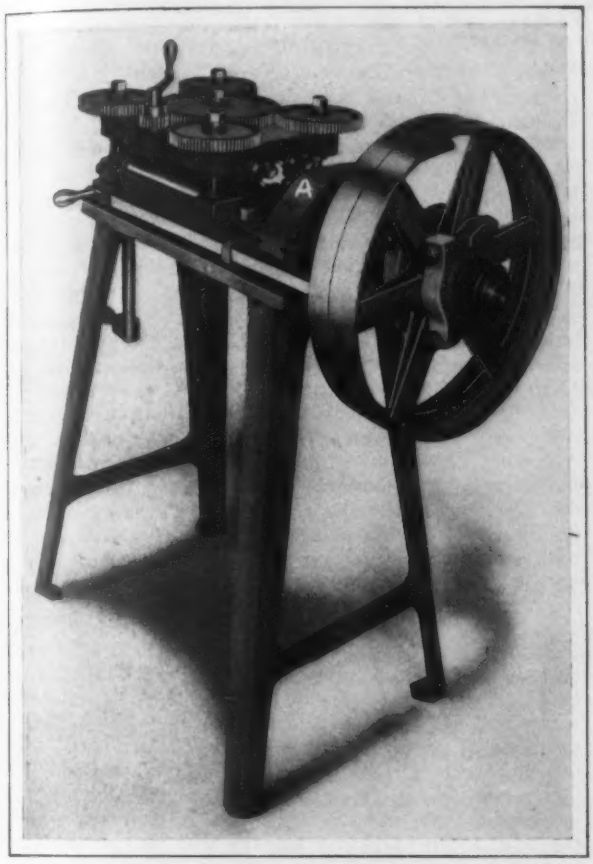
A New Steel Casting Company

The Eagan-Rogers Steel & Iron Company, Chester, Pa., has been incorporated under the Pennsylvania laws, with a capital stock of $100,000. A five-acre tract of land on the Pennsylvania Railroad, between Crum-Lynne and Eddystone, in what is known as the Chester district, has been acquired and contracts have been given the McClintic-Marshall Construction Company for several steel buildings. The company will produce light steel castings up to 200 lb., also gray iron castings, and will manufacture several specialties, expecting to be turning out product by March 1. An electric furnace, of a type in successful operation in England, for which the company has the American rights, will be installed. Prominently connected with the company are Daniel C. Eagan and John I. Rogers. The former is well known in the steel casting trade, having served with his father, the late Daniel Eagan, for a number of years. John I. Rogers is a consulting engineer, with offices at 929 Chestnut street, Philadelphia, who was formerly connected with the Midvale Steel Works, in that city.

The completion of the three new buildings of the Goulds Mfg. Company, Seneca Falls, N. Y., was celebrated January 19 by a ball given by the Goulds Mutual Benefit Association. The two new machine shops were handsomely decorated and equipped with special illumination for the occasion. A concert was given by Conway's Band, of Syracuse, after which the floor was cleared for dancing. The new hard maple floor had an excellent surface. Over 2000 people were present. The association, which is an organization for the benefit of sick members, made a handsome profit from the proceeds.

Five-Roll Stock Straightener

For use by manufacturers of sheet metal parts in connection with power presses and also by firms manufacturing cold rolled sheet steel and sheet copper and brass, the Standard Machinery Company, 7 Beverly street, Providence, R. I., has recently built a five-roll stock straightener. This machine is built in two types, both with and without a table and legs and the clutch and driving pulley.



A New Five-Roll Straightener for Sheet Metal Stock Built by the Standard Machinery Company, Providence, R. I.

Without these parts the straightener is intended to be attached to the bed of heavy power presses for straightening the stock prior to delivering it to the dies and in place of the pulley near the transmission case, either a ratchet or friction feed mechanism which is attached to a slotted disk on the outboard crank shaft bearing of the press is substituted. In this way the mechanism acts as a roll feed as well as a straightener. When the machine is built as illustrated it is fitted with a friction clutch and shipper arrangement as well as the driving pulley. The hight of the machine in this case is 36 in. On the opposite end of the main roll shaft there is a ratchet crank which is shown hanging down in the accompanying engraving and a ratchet that can be turned in either direction. In this way the stock is threaded into the rolls by hand and if the stock should become buckled it is thus possible to turn the roll in either direction to restraighten it. Another function of this arrangement is to secure better control over perforated material and also stock having large holes punched in.

Briefly the drive is through the transmission case A at the right end of the machine, the spur gears in this case being connected with the rolls by universal joints. The main roll, which is the middle one of the bottom train, is made positive like the two mates on either side of it and all three are driven directly by gearing. These three rolls are always positive and the adjustment is controlled on the upper one. The rolls are 2¾ in. in diameter and 10 in. long on the face and the upper ones are controlled by the spur gears shown on the top of the machine. The crank with the spur pinion enables the upper head to be raised or lowered to accommodate various thicknesses of stock. The adjusting gear and the transmission gears are steel and the rolls are of tool steel which has been hardened and ground.

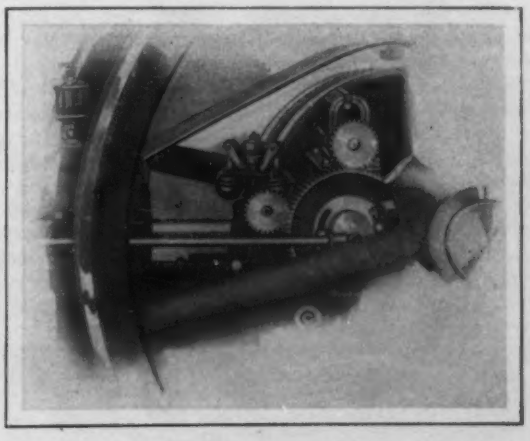
The over-all hight of the body of the straightener proper exclusive of the table and legs is 12 in., the over-all length including the driving pulley clutch and ratchet is 40 in., and the over-all width of the mechanism including the feeding table is 22 in.

A Built-in Magneto

In the future all of the standard type gas engines built by the Foos Gas Engine Company, Springfield, Ohio, will not have any batteries, a magneto being employed for running as well as for starting them. This is said to be the first American engine to embody a built-in magneto in its design and the change represents a radical attempt to make the gas engine a complete unit.

The ignition system on this engine consists of a wipe spark igniter, which in theory belongs to the same class as the make and break igniters used on stationary engines. It differs radically, however, in its mechanical construction and operation. Instead of the customary hammer action of this style of igniter the electrodes in the Foos igniter are only in frictional contact through the wiping action of a revolving blade, an arrangement which it is claimed causes the sparking surfaces to be wiped clean during each impulse and renders it practically impossible for the igniter to foul. Another advantage of this arrangement is that by reason of the short contact it would be better than batteries and a larger spark could be secured at a lower voltage. Another advantage of this arrangement is that the battery, coils, timers, switches and much wiring are eliminated and the mechanical equipment is simplified by the absence of a commutator, brushes or field coils. Friction wheels or a speed governor are not needed as the magneto is driven positively at the same speed as the engine, being geared directly from the crank shaft.

The size and the number of its magnets are a noteworthy feature of this magneto. Tungsten steel is employed for the magnets, which are made in sets of six, each one measuring 5/16 x 1½ in. The base is solid with holes in the end plates to prevent them from getting stopped up. Each magnet is securely bolted to the pole pieces by



View Showing the Location of the Magneto on the Gas Engines Built by the Foos Gas Engine Company, Springfield, Ohio

using special screws, which have been accurately ground. The armature is of laminated soft sheet iron and is mounted in a housing that, it is claimed, cannot distort or change its shape in any way. The windings are made with double insulated wire and the winding space is insulated with a special fabric impregnated with an insulating compound, special care having been taken to make the coil oil-proof.

The collectors for bringing out the current bear on smooth polished steel surfaces and the current is of the alternating type, having two peaks for each revolution of the armature. The relative position of these peaks is fixed and synchronized by the positive gear drive and by setting the armature in the proper relation to the engine. During the remainder of the revolution the current does not possess sufficient power to produce sparks.

American Machinery in Brazil

A Market in Which There Is Much Promise, Particularly in Railroad Lines—A Leaf from the Book of European Traders

BY T. P. GOURLEY

For about six months I have had opportunity to study Brazil and its people at first hand. Like many others I had read a good deal about both the country and its inhabitants before I came here. I am glad I came, for I have learned much, and I trust that what I have learned may not only prove useful to myself but to other Americans, whose business prevents them from crossing the seas to find out for themselves. First, let me say a word or two concerning the people who are native to the soil.

The keynote of the native Brazilian character is courtesy; if it is not so, then I have been a most fortunate individual, for during my residence in the country I have not experienced, from rich or poor, high or low, anything but the most charming politeness. If later I discover that my first impressions are wrong I shall be sorry. In business the men of Brazil are a pleasure to deal with, for they can say yea or nay to a proposal without feeling it incumbent upon them to hurt any one's feelings, and that makes life a good deal more enjoyable. In some countries where I have sojourned the men of business seem to consider it absolutely necessary to be gross, in order to prove more emphatic, but it is not so with the Brazilians. A good man of business in Brazil counts good manners as an indispensable part of his equipment. He knows what he wants to buy or sell as well as his confrères in any other part of the world, and is not easily overreached in a matter that touches his pocket; but, buying or selling, he seldom forgets that he is a gentleman first. If you ride out for a day with a peon for a guide, he will show you in the course of the journey a score of little attentions which go to prove that he is unostentatiously courteous, and courtesy is the keystone to the arch of comfort.

Openings for American Machinery

Every one knows, the world over, that Brazil is remarkable for minerals, timber, rubber, beef, horses, hides, coffee and fruit, but I doubt if every one knows the potentialities of the country from some other points of view. This remark will, I think, apply as much to the United States as to any other part of the world. The financiers, the money lenders of the United States, know all about Brazil; they have advanced a certain amount of capital to the people here (at good interest) which has enabled this country to go ahead as it has done; and it will be a pity if the American nation does not as a whole reap substantial benefits from this outlay of American money. It is really a matter for wonder, when one considers the small amount of machinery sold by American manufacturers to Brazil; it almost seems that the American manufacturers do not realize the magnitude of the market that is slipping away from them through inattention and want of business push.

In the future, if the United States means to get and hold this valuable machinery market, the people here must be specially catered for. It is a case of "America, wake up," or back down to the great rivals who are now in the field. Looking about Brazil this fact impressed itself upon me—that American machinery manufacturers allow customers to look for the machinery instead of sellers seeking the buyers. It is easily recognized that American machinery is giving better satisfaction than much of that turned out by rival nations; American prices compare favorably with the prices of other nations; but the difference in favor of the American article in the matter of quality is not so great that the American can afford to sit down and take his ease, while the other nations get up and hustle. It is just as well to have it thoroughly understood that other nations are hustling.

Enterprise of Foreign Competitors

Wherever I go I find English and Germans pushing trade. If I go to a man's shop, who is thinking about purchasing some new machinery, nothing is surer than that I will run into some enterprising "carpet-bagger" representing one of the English or German manufacturers. The carpet-bagger is a valuable national asset. He goes about puffing his goods in all sorts of ways, and he loses no chance of glorifying his nation as the only nation under heaven capable of manufacturing good machinery. He will not stop at talk. He will put a machine in on trial to demonstrate its practical efficiency; and the result is that he gets the order. The American attempts to sell his machine by showing blue prints, which generally results in his losing the order because his firm does not provide him with a machine. This is the big market, and any article manufactured out of American steel in American shops would be looked upon with favor, if the people only knew that they could still get the genuine articles from the proper source when they wanted them. It is a question of giving them the goods they want when they want them. It is claimed by trade rivals that the American manufacturers will not adapt themselves to new conditions, and I regret that from my observation I must endorse that dictum to a certain extent. Insularism will have to be laid aside in the race for this market in the future.

Mining Machinery

Though not yet in very great demand in Brazil, mining machinery will very shortly have its day, especially machinery for drilling and excavating. American manufacturers will do well to keep the Brazilian public thoroughly informed of the fact that there is no country in the world in which such reliable mining machinery and mining tools of all sorts can be obtained as in the United States. The information that is required is first hand information on the spot, for it takes too long to send to the States and wait for a reply, even after the Brazilian mining companies have managed to discover the whereabouts of a suitable firm.

New Railroad Projects

On all sides we hear of new railroad projects opening up in Brazil, and there can be no doubt that in the immediate future old lines will be extended and new ones laid down. All the steel rails, all the workmen's tools and all the machinery that will be required are as yet unbought; and, though Americans at home may not realize it, Brazil is going to prove almost at once a veritable Klondike for the manufacturers of locomotives, cars and steel rails. Who will get the orders for all this work? Personally I do not feel too sure that Americans will secure them. I note how the agents of other countries are working to secure influence in high places, and I note also some of the Americans keep independently aloof; and yet the prize is worth working for. Talk about the romance of gold; The romance of steel that is developing in every corner of Brazil is far more wonderful in every respect, and it will be something very nearly akin to a national calamity if America fails to secure these orders. We lost the order for the last lot of warships and we will lose the next if our people do not exert themselves. That loss was a blow to our national prestige in South America—two battleships built by England at a cost of $10,000,000 each. But if we fail to get the orders for the locomotives, and all the railroad equipment, it will be a greater loss still, for every engine is an advertisement that penetrates to the hinterland of Brazil. I would point out to the American manufacturers that this is a land of new developments, and it will be generations hence ere the native Brazilian takes to manufacturing machinery of any sort in earnest. Are the Americans going to let their trade rivals take this rich harvest away from them, or give the British Lion and Herr Schmidt a hard run for first honors?

Present Railroad Development

The Brazilian Republic occupies the tenth rank among the nations that have railroads, being still led by the

United States, Germany, Russia, India, France, Great Britain, Austria-Hungary and Australia. Brazil has in operation at present, in both broad and narrow gauge, about 26,000 miles, with several lines under construction. The largest railroad is the Central Railroad of Brazil; it is owned by the government and operated under its supervision. It has 2500 miles in operation, including both broad and narrow gauge, and about 3000 miles under construction. The executive heads are Minister of Railways, four directors and sub-directors. The Central at present is undergoing a tremendous transfiguration to make its efficiency equal to that of the large railroads of America. New shops are being built, and the most up-to-date automatic machinery for cars and locomotive building and repairing is being installed. Dr. Paulo de Frontin is practically the executive head of the Central lines. He is the director-general; although the Minister of Railways is his superior, the entire responsibility of operation is on his shoulders. He has as one of his advisers one of the best Brazilian engineers, Dr. E. Schmidt, chief engineer of the shops. Drs. Frontin and Schmidt are men of modern ideas, both having made trips through Europe, Canada and the States, visiting all the principal railroad shops, to obtain information as to the best and most modern equipment for railroad practice. Drs. Frontin and Schmidt are considered two of the best engineers in Brazil, and great credit should be given them for making the Central Railroad what it is to-day. To make a high standard of efficiency on the Central is indeed no easy task. It being a government road, naturally, as in all government controlled systems, inexperienced men holding high salaried positions and retaining them through the political influence make it very difficult to reduce cost of operation.

Central Railroad Equipment and Shops

The rolling stock of the Central consists of the following: For broad gauge (1 m 60 mm)—425 locomotives, ranging from 45 tons to 150 tons (14 of the Mallet type, 150 tons, for heavy grade service), 100 sleeping cars, 15 parlor cars, 8 dining cars, 580 passenger coaches, and 1500 freight cars ranging from 20 to 40 tons capacity. For the narrow gauge (1 m) the equipment consists of 125 locomotives ranging from 25 tons to 55 tons, 50 sleeping cars, 8 parlor cars, 6 dining cars, 285 passenger coaches and 600 freight cars ranging from about 15 tons to 30 tons capacity. In conjunction with the railroad system it operates three gasoline launches—one 65 hp., 75 tons, and two 35 hp., 45 tons—for transporting freight on inland rivers. All locomotives owned by the Central of Brazil are of American manufacture, built by the Baldwin and American Locomotive companies.

There are 11 repair shops, distributed over the various sections of the Central Lines, but the main repair shops are located eight miles from the city of Rio de Janeiro on the main line and cover an area of 25 acres. The boiler shop is 330 x 85 ft., has one electric traveling crane of 85 tons capacity, main hoist, with 10 tons auxiliary. This shop will have the most modern equipment for repairing boilers. The locomotive construction shop is 255 x 95 ft., has two electric traveling cranes, one of 125 tons capacity and one of 10 tons capacity, and will be equipped with up-to-date machinery for assembling locomotives. There are two machine shops, one 100 x 200 ft. and one 100 x 175 ft. These are equipped with the most modern driving wheel, car wheel, axle and small lathes, boring machines, milling machines, turret lathes, shaping machines, planers, drills, grinders, etc., furnished by the Niles-Bement-Pond Company and William Sellers & Co., Inc. Most of the machines are independent motor driven. The foundry is 275 x 100 ft. equipped with two Whiting cupolas and motor-driven blowers, also electric elevator for charging platform, one electric traveling crane of 15 tons capacity, core oven, etc. Castings up to 12 tons weight can be made. There is also provision for installing an electric furnace for making steel castings. The foundry equipment was furnished by Wonham, Sanger & Bates. The blacksmith shop is 200 x 100 ft. It has a 10-ton electric traveling crane, and is equipped with motor-driven saws, forge hammers and oil-burning forges. Cars of all classes are repaired and painted at these shops, and the woodworking department is equipped with modern motor-driven machinery, most of it furnished by the J. A. Fay & Egan Company.

Although the Central Railroad of Brazil is the largest in the Republic, there are others that should be mentioned, among them the Great Western of Brazil, which has in operation about 1700 miles; the Leopoldina, 1500 miles; the Sorocaband, 1800 miles, and the Paulista, 1000 miles. I have gone into detail concerning the Central to show American manufacturers the market for railroad equipment. But, bear in mind, railroad equipment is only one of a number of classes needed in this country in the mechanical line. It will be America's own fault if her trademark is not upon the machinery and equipment that are imported into Brazil.

The Mineral Production of Texas

The University of Texas Bureau of Economic Geology and Technology gives in a recent press letter a summary of the statistics dealing with the value of the mineral products of Texas for the year 1910. The total value of the mineral products for the year is placed at $16,500,000. Some of the items enumerated are as follows: Asphalt, $1,040,825; clay industries, excluding pottery, $2,744,845; coal, $2,397,858; iron ore, $34,003; lignite, $763,107 and tin, $2,586. For the first time in its history the State enters the list of tin producers, and it is now the only State which is making tin from native ores. This industry has been established in the Franklin Mountains, 14 miles north of El Paso, where tin ore occurs in granite.

For the years since the collection of the earliest reliable statistics the total value of all the mineral products of Texas is about $180,000,000, of which petroleum has contributed $66,000,000, coal (and lignite) $31,000,000, clay products $31,000,000 and pig iron $3,000,000. It is estimated that Texas does not produce one-half of the coal it uses. This is not because there is a lack of coal-bearing formations, for there are probably more than 13,000 sq. miles of coal area in Texas, in addition to 60,000 sq. miles of lignite area. The bulletin says: "It may be many years before Texas will rank higher as a metal-producing State, and in the meantime it is suggested that the course of wisdom is to study the problems dealing with the more economical and profitable use of materials that enter into everyday life."

British Coal Miners Vote to Strike.—The recent ballot among the coal miners of Great Britain, the result of which was officially announced January 18, was overwhelmingly in favor of a strike for a fixed minimum wage. The figures were: For a strike, 445,801; against a strike, 115,921. Notices to quit work will doubtless promptly be handed in by the miners, and this threatens to bring about a national stoppage of coal mining on March 1. The intervening weeks, however, give considerable time for negotiations between the employers and the workers, and efforts at mediation may be expected to avert what would otherwise prove a national calamity.

The Ewer Wrench & Tool Mfg. Company, Howell, Mich., at its annual meeting January 16, elected the following officers: Malcolm G. Ewer, president; Frederick Seagraves, vice-president; Stephen E. Hartnell, secretary-treasurer. The foregoing and Fred. E. Tallmadge and John S. Shields are directors. All are residents of Detroit. Messrs. Ewer, Hartnell and Tallmadge are the officers and directors of the Ewer Sales Company, which takes the entire output of the Ewer Wrench & Tool Mfg Company, and in addition manufactures and markets the Ewer automatic car seal. All business of the Wrench Company will be conducted from the office of the Ewer Sales Company, 45 State street, Detroit, Mich.

Official announcement has been made in St. Louis by Vice-President C. G. Burnham that the Burlington system will be extended from Alton, Ill., to Centralia, Ill.; that the Mississippi River will be bridged at Alton, and the Ohio River at Metropolis, Ill., thereby reaching into the Southeast. The construction work involved represents an outlay ultimately of about $30,000,000.

Hours and Intensity of Steel Works Labor

A Study Showing That the Hours of Hard Work Are Fewer than Has Been Represented—Open Hearth Work Severe

BY SIDNEY G. KOON.

In connection with an investigation by the United States Government into conditions of labor in the steel industry, a comprehensive time study was made in one of the large steel works of the Pittsburgh district, covering the three main branches of the major side of the industry—the blast furnaces, the open hearth furnaces and the blooming mills, with their attendant soaking pits or heating furnaces. In each case, from seven to nine different characters of work (different "jobs") were studied. Complete watch was kept, for a period of 48 consecutive hours, on each of the men or groups of men involved; except that in five cases of the 23 studied the time of observation, for special reasons, was limited to from 30 to 36 hours each. Every move the worker made was recorded by a man with a note book and a stop watch; and the entire record was then subjected to careful analysis, some of the results of which are here given.

Blast Furnace Workers

Beginning with the logical start of the series—the blast furnaces—the following seven men were studied for a period of 48 hours each: the larryman, hoistman, hot blast man, furnace keeper, first helper, second helper and cinder snapper. In the cases of the first two the work performed was given the arbitrary designation of "light labor." In the other cases it was subdivided, according to conditions, into light, medium and hard labor, and (in the case of the hot blast man) the further item of "observation." The hours of working time and of idle time, with the respective percentages of each, are given below:

TABLE I.

	Observed Time.* Work. hr. min.	Idle. hr. min.	Percentages. Work.	Idle.
Larryman	30:34	17:26	63.7	36.3
Hoistman	29:50	18:10	62.2	37.8
Hot-blast man	32:18	15.42	67.3	32.7
Furnace keeper	37:56	10:04	79	21
First helper	39:45	8:15	82.8	17.2
Second helper	37:01	10:59	77.1	22.9
Cinder snapper	37:10	10:50	77.4	22.6
Mean	34:56	13:04	72.8	27.2

*The observations of separate items ran to tenths of minute.

The subdivision of the labor covered in Table I is as follows in percentage of total working time only:

TABLE II.

	Hard.	Medium.	Light.	Observation.
Hot-blast man	38.2	2.5	47.2	12.1
Furnace keeper	77.4	5.1	17.5	...
First helper	57.4	32.1	10.5	...
Second helper	66.9	6.6	26.5	...
Cinder snapper	64	17.9	18.1	...
Mean for all seven in Table I.	46.2	10.1	42.1	1.6

Open Hearth Workers

In the open hearth department nine men were studied, two of whom—the locomotive engineer and brakeman—were grouped as one unit, with a total of 32 hours observed, their labor being characterized as "light." Of the remaining men studied the first helper accounted for 33 hours; the stripper craneman for 30 hours (his labor was "light"); while the charging machine operator (light labor), the second helper, third helper, ladle craneman (light labor) and steel pourer (hard labor) were watched for 48 consecutive hours each. The general results are tabulated, as for the blast furnace men, in:

TABLE III.

	Observed Time.* Work. hr. min.	Idle. hr. min.	Percentages. Work.	Idle.
Charger	20:24	27:36	42.5	57.5
First helper	8:58	24:02	27.2	72.8
Second helper	22:04	25:56	46	54
Third helper	17:46	30:14	37	63
Ladle craneman	24:46	23:14	51.6	48.4
Steel pourer	14:24	33:36	30	70
Brakeman-engineer	15:54	16:06	49.6	50.4
Stripper craneman	11:03	18:57	36.7	63.3
Mean	16:48	23:59	41.2	58.8

The subdivision of labor for the three cases involved follows in percentages of total working time:

TABLE IV.

	Hard.	Medium.	Light.	Observation.
First helper	32.7	27.4	11	28.9
Second helper	72.8	19.6	7.6	...
Third helper	67.9	13.5	18.6	...
Mean for all nine in Table III.	30	6.1	62.2	1.7

Blooming Mill Workers

In the blooming mill department the bottom maker is represented by 35 hours 21 minutes, his labor being "hard." The pit cranemen, two tongsmen, engineer, roller, manipulator man, shearman and shear crew were all observed for 48 hours. All of this labor is characterized as "light," except for the tongsmen, in whose case it is 15 per cent. light and 85 per cent. heavy. The general figures follow in the same way as before:

TABLE V.

	Observed Time. Work. hr. min.	Idle. hr. min.	Percentages. Work.	Idle.
Pit craneman, tongsmen.	12:24	35:36	25.8	74.2
Bottom maker	7:24	27:57	20.9	79.1
Engineer, roller, manipulator	29:17	18:43	61	39
Shearman and crew	19:23	28:37	40.3	59.7
Mean	19:55	26:16	43.1	56.9

There is less variation in the characterization of the work in this department than in the two others studied, 12.85 per cent. being considered as falling in the category "hard," and 87.15 per cent. being classed as "light."

The Three Classes Combined

Taking the three departments as units, and comparing them on this basis, we have:

TABLE VI.

	Observed Time. Total. hr. min.	Work. hr. min.	Idle. hr. min.	Percentages. Work.	Idle.
Blast furnace	336:00	244:34	91:26	72.8	27.2
Open hearth	367:00	151:13	215:47	41.2	58.8
Blooming mill	323:21	139:26	183:55	43.1	56.9
Totals	1026:21	535:13	491:08	52.1	47.9

TABLE VII.

	Hard. hr. min.	Medium. hr. min.	Light. hr. min.	Observation. hr. min.
Blast furnace	113:00	24:37	103:01	3:56
Open hearth	45:27	9:10	94:00	2:36
Blooming mill	17:56	...	121:30	...
Totals	176:23	33:47	318:31	6:32
Percentages	33	6.3	59.2	11.2

Severity of Such Labor Exaggerated

Interesting from a speculative or philosophical standpoint only would be an attempt to transform the figures in Table VII into equivalent values of one denomination. Assuming, for instance, that one hour of hard labor is equivalent to 1½ hours of light labor or observation, and that one hour of medium labor may count for 1¼ hours, we have a total of 632 equivalent hours of light labor, as against 1026+ hours observed, or 61.6 per cent. equivalent working time, and 38.4 per cent. equivalent idle time.

Viewed from the actual figures given, showing averages of only 52.1 per cent. working time, more than 60 per cent. of this being light labor, the physical condition of specific types of more or less skilled labor in the steel making industry does not appear nearly so bad as would be indicated by common opinion in the matter. This is especially true when comparison is made with many other industries, in which the percentages of working time would show above 90. There are two great elements militating against the "bed of roses" for the steel worker, however. One is the great heat to which the men are exposed during a large part of their working hours, and the other the very onerous hours of labor, averaging 12

hours per day, and including often Sundays and all holidays excepting Christmas and the Fourth of July.

Considering now the open hearth only, it would be very difficult to find more arduous and exhausting work than "fettling," or "making bottom," in July or August. Yet out of the 48 hours 48 minutes recorded in Table III as working time for first, second and third helpers, 9 hours 34 minutes, or 19.6 per cent., was just this work, and the observations were taken during the first 10 days of August. The temperature in the furnace during this operation is about 2900 deg. Fahr. The men have to approach within two or three feet of a door opening upon this incandescence, and the mere physical effort of throwing a shovelful of light dolomite against a backwall 17 to 20 ft. away is considerable. Small wonder, then, that many a college athlete has wilted under it.

The Question of Hours

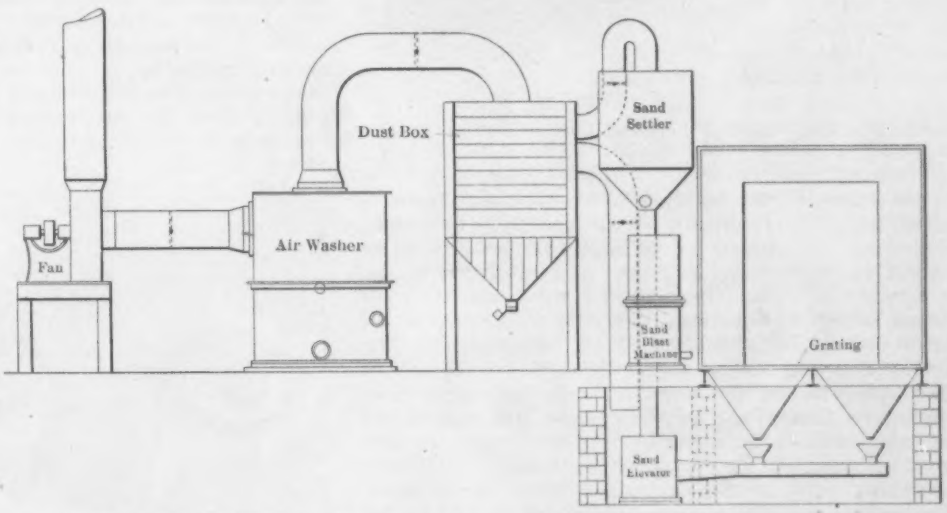
As to hours: These huge metallurgical processes are necessarily continuous, except a very heavy expense be accepted in the shape of repairs and upkeep, together with great loss in operating speed for 24 or 36 hours following even a partial shutdown. Competition is keen, and these expenses and retardations do not look well on the balance sheet. Tonnage is a sort of fetish. And so we find that one crew, working from 7 a. m. to 5 p. m. during six days of the week, has the very respectable total of 60 hours to its credit. The other crew, or night turn, working 24 hours on the Sunday, and then from 5 p. m. until 7 a. m. for the remaining six days, shows 108 hours, or an average of practically 15½ hours per day for the seven days. The next week the two crews exchange places, this 24-hour Sunday or "long turn" being the "medium of exchange," so to speak. Thus the weeks alternate—60 hours, 108 hours, 60 hours, 108 hours, right through the year.

Every three or four months, when the furnace requires general repairs, there is a respite of four or five days, without pay. This enforced idleness never causes much grumbling.

Sand Blast Cleaning Room

In the design of its improved sand blast cleaning room and exhaust system, the Tilghman-Brooksbank Sand Blast Company, 1126 South Eleventh street, Philadelphia, Pa., has two objects in mind. The main one which it sought to obtain was to make the conditions of work for the sand blast operator as healthful and comfortable as possible and in addition to increase the output by providing a clear atmosphere in which the operator could see when the work was completed. In addition to these two things, another advantage of the machine is the returning of the sand automatically so that it is not necessary to stop work to recharge the machine.

The room, which is made with ⅛-in. steel walls, a floor of ½-in. perforated steel and a plate glass top with ventilator openings, is built in sections for convenience in shipping and erecting. This device is said to embody features which have not been found before this time in any other device now on the market. An ample supply of light and air is received through the top and the perforations in the floor extend all the way to the wall, thus preventing an accumulation of sand since this material together with dust is drawn down into hoppers, leaving the floor clean and the air in the room clear.



A New Sand Blast Cleaning Room Made by the Tilghman-Brooksbank Sand Blast Company, Philadelphia, Pa.

Beneath the floor of the cleaning room there is an entirely new sand elevating device which is mounted in a pit 5 ft. deep. Four hoppers receive the used sand and dust from the cleaning room and carry it to the horizontal sand elevator pipes which discharge into the vertical sand pipe. A current of air generated by the exhaust fan draws the sand upward to the separator, where the particles of sand suitable for use again are arrested and returned automatically to the sand blast machine. The residue which consists of very fine sand and dust is automatically carried out of the sand separator through pipes leading into the dust box, where heavier particles are deposited. The fine dust is carried on and is finally deposited in the air washer in the form of mud which is shoveled out periodically.

Cincinnati Foundry Foremen.—The Cincinnati Foundry Foremen's Association held a called meeting in one of the Ohio Mechanics Institute's committee rooms, Cincinnati, Ohio, on the evening of January 27. After the transaction of routine business Fred J. Brunner, of the S. Obermayer Company, gave a very interesting talk on Cuba, showing a number of photographs that he took while on a recent trip through the island. James A. Murphy, superintendent of the Hooven, Owens & Rentschler Company, Hamilton, Ohio, and a prominent member of the local association, read a ludicrous paper on the primitive method of breaking heavy castings. Through the courtesy of Prof. John L. Shearer, president of the Ohio Mechanics Institute, the association will hold all future meetings in one of the numerous classrooms of the building, and he was extended a very hearty vote of thanks by those present.

Surveys are being made in southern Illinois by the Springfield & Southern Illinois Electric Railroad Company, of which Isaac A. Smith, of St. Louis, is president, for a system embracing nearly 500 miles of interurban construction. The basic east and west line runs from East St. Louis, Ill., to Terre Haute, Ind., and the north and south line from Springfield, Ill., to Mount Vernon and Evansville, with a number of branches.

The N. O. Nelson Mfg. Company, St. Louis, Mo., has elected N. O. Nelson, president; L. D. Lawnin and A. B. Pierce, vice-presidents; G. B. Chambers, secretary-treasurer. Other directors are. J. A. Senkosky, S. L. Hillebert and William Shaw. The company, which is a large producer of plumbers' supplies, is conducted on a co-operative basis and paid its employees a dividend equaling 20 per cent. of their annual earnings.

The Wagner Electric Company has been entertaining the past week 50 department heads, district managers, etc., at its headquarters in St. Louis, the meetings closing with a banquet at which each was presented with a menu bearing his portrait when a child and another of the present day. The music for the banquet was supplied by district managers E. W. Goldschmidt, of New York, and Ludwig Hommell, of Pittsburgh.

New Recording Liquid Level Gauge

The recording liquid level gauge shown in the illustrations is designed by the Industrial Instrument Company, Foxboro, Mass., to make continuous records in ink on a

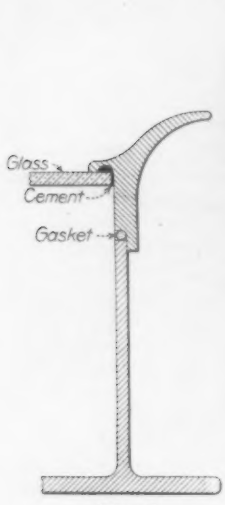


Fig. 2

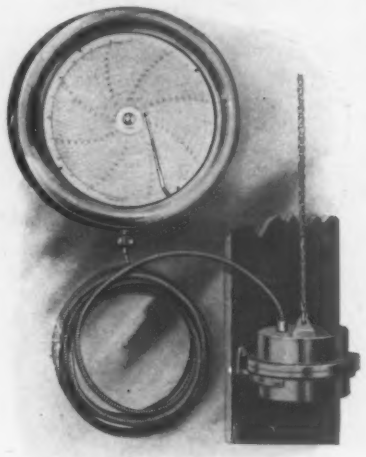


Fig. 1

Liquid Level Gauge Built by Industrial Instrument Company, Foxboro, Mass.

circular chart of the hight of water or other liquids in tanks, water in reservoirs, dams, forebays, tail races, sewers, etc. It consists of an improved round form recording gauge connected by means of a small copper tube to a rubber diaphragm, inclosed in a brass case, the lower section of which is perforated for the admission of the liquid.

A pressure equivalent to the depth is exerted against the diaphragm and this pressure is transmitted as compressed air through the connecting tube and recorded on the circular chart which revolves once in 24 hours or 7 days, as desired. Fig. 1 shows the compact diaphragm movement employed for the ranges up to 20 ft. depth. The pen arm is attached to and supported by a small but substantial shaft, which serves as an axis of rotation, giving ruggedness and stability for service.

Fig. 2 shows how the recorder is made moisture and dust tight by means of a gasket between the door and body of the case, and by cementing the glass in the door. The recorder may be located at any convenient place, the connecting tube being 100 ft. long, if necessary.

The advantage of distance from the location of the bulb, so that the equipment is not affected by freezing temperature, will be appreciated.

Texas Iron Developments

Advices from Texas state that a tract of about 20,000 acres of iron ore land situated in the counties of Anderson, Henderson and Cherokee has been purchased by an Eastern syndicate represented by J. H. Hallock, Syracuse, N. Y., and H. M. Sellick, Ontario, N. Y. They are also said to be negotiating with the authorities of Texas for the purchase or lease of the iron furnace at Rusk, which was operated for several years in connection with the penitentiary. It is reported that this syndicate will also take over the iron ore lands which Texas owns in that section.

The matter of disposing of the furnace is now being considered by Governor O. B. Colquitt and the Penitentiary Commission. The plant has been closed down for the last three years, due, it is said, to failure on the part of the State to operate it economically, although convict labor was used. During the administration of Governor Lanham it was operated at a considerable profit, the Legislature having made an appropriation of $150,000 to experiment with the furnace and the manufacture of cast-iron pipe and certain other articles. The furnace has a daily capacity of 100 tons, but it frequently made 125 tons a day.

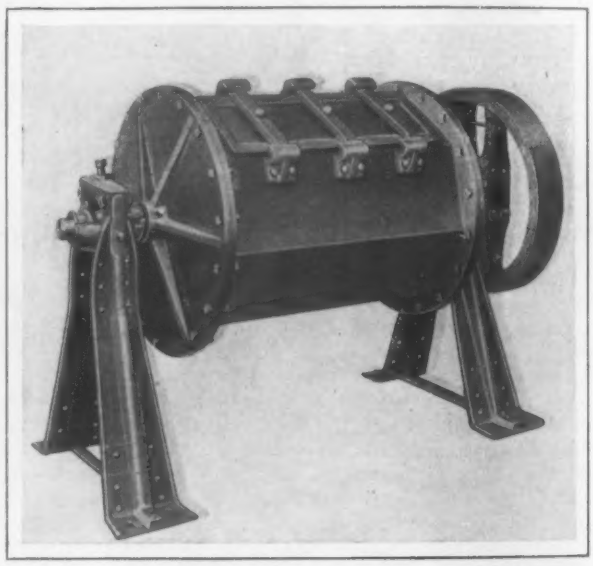
The ore lands which this syndicate has purchased are situated adjacent to the International & Great Northern and the Texas & Pacific railroads. It is reported that if the negotiations that are now pending for securing control of the furnace at Rusk are not consummated the syndicate will build its own plant.

It is announced that everything is now in readiness for starting large shipments of iron ore from the mines which Charles M. Schwab and associates are opening up near Ore City. The Port Bolivar & Ore City Railroad was recently finished from Longview to Ore City and is now in regular operation. It connects at Longview with the Santa Fe, over which the ore shipments will be made to Port Bolivar and thence sent by vessel to Pennsylvania.

Tumbling Barrel for Long Pieces

Tumbling long pieces is the special field designed to be covered by the new tumbling barrel which has recently been brought out by the Globe Machine & Stamping Company, Cleveland, Ohio. It is made of either cast iron or brass and is polygon shaped so that the contents will tumble rather than slide in a mass. The weight of the machine with a cast-iron barrel is approximately 900 lb., while with a brass barrel it is 100 lb. heavier.

The barrel is 24 in. in diameter and 30 in. long with an opening measuring 24 x 10 in. It has a capacity of between 500 and 600 lb., of small pieces. A belt drive with a pulley 30 in. in diameter and having a 4-in. face can be furnished or, if desired, a gear drive having a ratio of 4



A New Style of Tumbling Barrel Designed Especially for Handling Long Pieces Built by the Globe Machine & Stamping Company, Cleveland, Ohio

to 1 can be supplied. The barrel is made watertight and the cover can be put in place or removed very quickly, a slight turn of the locking cross bars that swing on a pivot on the cover fastening or releasing it. The usual speed of the barrel is approximately 100 r.p.m., although the speed can be made faster or slower, depending upon the character of the work being handled.

The Lackawanna Steel Company, for nine months ended September 30, 1911, according to a statement published in financial journals, showed a manufacturing income of $1,907,084, compared with $4,021,493 in 1910. After proper deductions, the nine months of last year showed a net profit of $147,644, while the same period for 1910 showed $2,286,335. At the end of the third quarter of the company's fiscal year the books showed 189,898 tons of unfilled orders.

The blast furnace of the Upson Nut Company, Cleveland, Ohio, has been blown out for repairs. The furnace will be relined and will be equipped with a new hearth jacket, enlarging the hearth and increasing the capacity of the furnace somewhat.

The Proportioning of Overhead Costs

A System to Insure Watchfulness— Dividends Included as a Factor— Estimates Reduced to a Basis of Days

The watching and proportioning of overhead costs in manufacturing plants is one of the most important elements of efficient shop management. Intelligent watchfulness eliminates costly wastes. Intelligent apportionment rids an establishment of those serious discrepancies between actual and recorded costs which constitute the weak spots in a great many cost systems. A manufacturer of machinery has evolved an interesting and in some respects an unusual system which keeps the management in constant close touch with overhead expense in its various items. Its features, as they were explained to a representative of *The Iron Age* who visited the plant recently, are described below:

A Monthly Overhead Budget

Each month a budget is compiled consisting of the items of overhead, each being designed by an order number. In some cases one order includes a group of expenses; for example, that which consists of oiling, belt repair, sweeping, window washing and various other odd jobs. Other orders are millwright, machine repairs (minor), small tool upkeep, piping, house painting, shipping and receiving, care of clips and extracting oil, general inspection that cannot be charged to special jobs, supervision and instruction, including foremen and shop office work.

For each order is appropriated a sum of money which it is estimated should be expended in the ensuing month. This sum is reduced to terms of days. That is to say, if the estimate is $250 and there are 25 working days in the month, the budget shows a daily unit of $10. The difference in productive hours between months is a factor which it is necessary to take into consideration, for the variation may be considerable, and even great, as in the case of a summer vacation. At the end of the month a statement is prepared, showing the budget figures, and the actual costs for that month, as well as for the months preceding it. Naturally, there is some variation from month to month in the average daily cost of the various overhead orders, and in studying results an average of three months is taken before any change in appropriation is made.

If, for example, a certain order is given a daily allowance of $5 in a budget for January and the actual cost was $5.10 it would attract no special attention. Even if in February the actual cost rose to $5.15 the budget figure would not be increased, because of the possibility that March would show a cost so low as to strike the average of $5 a day. But, if March developed an expense of $5.12 it would be time to give the matter particular consideration. During these three months the management is watching this item in the attempt to determine whether the higher cost is necessary or not. If it can be reduced by better methods, the result shows in the costs of succeeding months; but if the actual cost still stays up, the budget may be raised to correspond with it. This readjustment is made four times a year.

Under-Expenditure Calls for Vigilance

The management has before it at frequent intervals the progress of the works in the various items of burden cost, as a source of constant reminder and suggestion, not only as to wastes and extravagances but as to neglect to spend money where it is needed. If the actual cost is low on some one order, the suspicion may be aroused that necessary work is not being done. If the cost of machine repair should fall off radically and the manager or superintendent in going through the works should notice that some machine remained idle for a number of days, he would be more apt to inquire the reason for it. If it were out of repair, the reason of the small cost noticed in the budget would be revealed. It is wisdom to watch for a failure to maintain a plant as well as for excessive expenditures.

The budget consists of expenses which belong to the shop proper. Other items apply to the whole establishment Some of them are constant, such as taxes and insurance. Of these the shop must bear its proportion.

This company includes dividends in the constant class of overhead costs. The capital stock is considered as a loan upon which there is the same obligation to pay a return as if the money were borrowed from a bank. Though the obligation is not a binding one legally, the company assumes that the stockholders are entitled to it and that the lowest point which should be reached in estimating the cost of a product should include the item of dividend. The theory is that there is no other way of knowing exactly what dividend a job itself should earn than by including the item in the actual cost. The important fact is that the company knows where it stands at any time of the year.

The company does nothing by percentages, its reason being that to work out results in percentages would necessitate a constant basis with which to make comparisons. If in the budget record the actual expenditure is $30, as compared with the estimate of $25, the loss is recorded at $5 and not at 20 per cent.

The Question of Depreciation

In determining overhead the matter of depreciation is very important but is often neglected. It is not fair to charge a constant percentage of depreciation to all jobs alike. To illustrate: The company in question was making a large number of cutters. The orders came intermittently, so that the work had to be scattered through the year. It was necessary to use a Brown & Sharpe universal milling machine for the work, and this disorganized the routine of manufacture. The cutters were either holding up other work which required the machine or were being held up themselves by other work. Sometimes $50 worth of cutters would be holding up $1,500 worth of other product, which meant that $1,500 in capital would be idle for several weeks. Finally a special machine was built for cutters—a more or less crude affair costing $200, but serving its purpose well. The problem of depreciation charge on the machine had to be met. It was estimated that 2000 cutters would be manufactured on this machine, and, as its cost was $200, each cutter would bear its proportionate share of cost, in other words, 10 cents.

Another element in overhead which is too often neglected, for it may be an important item, may be called the "hindrance charge." As in the case of the Brown & Sharpe machine, a lot of cutters holding up a considerable value of product might very well be charged with the earning power of the $1,500. This should be taken into account whenever it is possible.

The Penn Metal Company

The Penn Metal Company, 201 Devonshire street, Boston, Mass., has been incorporated under the laws of Massachusetts with $75,000 capital paid in, to take over the New England department of the Penn Metal Ceiling & Roofing Company, Ltd., of Philadelphia. The managers of the old company are the officers and owners of the new. George A. Sagendorph, founder of the Boston department in 1899, is president and treasurer; Francis M. Johnson is vice-president and James P. Dolan is secretary.

The Penn Metal Company claims to have the most complete factory in New England for the manufacture of sheet steel fireproof building material, which includes expanded metal lath for plaster, concrete reinforcement, metal ceiling, fireproof materials for garages and fireproof roofings of metal. It operates under many patents of the late L. Lewis Sagendorph, a pioneer in this line, who did so much to develop and promote the use of fireproof materials of sheet steel for building purposes.

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The Steel Corporation and the Metal Schedule

Chairman Stanley, in calling last week for detailed costs of the Steel Corporation, declared that it was necessary to have these figures so as to find out the difference in the costs of producing steel in this country and abroad. The statement implied that the costs of foreign producers are already in hand or are easily obtainable. The investigators who went to Europe when the Payne tariff was in the making could fill a respectable volume with the information they obtained relating to nearly everything connected with the iron and steel manufacture in Great Britain and on the Continent except the cost of production. Free from the menace of official inquisitors at home, like those now in action at Washington, who make a virtue of attacking home industries and of laying bare inmost facts for the benefit of foreign competitors, the European steel makers had no fear of these American investigators. They found some amusement, in fact, in the idea that statesmen on this side would think them guileless enough to yield up the facts as to their trade position, to aid in the making of an American tariff. It was left to the particular variety of patriots now flourishing in American politics to show to competing steel making countries how blood may assume the consistency of water when trust baiting is the absorbing political game.

There is another feature of this situation that is more serious than the publication broadcast of the costs of the Steel Corporation. In all the agitation for radical reductions in iron and steel tariff schedules, the ability of the Steel Corporation to meet foreign competition has been taken as the pivotal point. The corporation's earnings have been large and they must be cut down. The popular imagination has been fed on stories of vast fortunes made in steel—not by those now engaged in manufacturing steel, be it noted, but by those who sold out their holdings; and the statesmen at Washington can scarcely wait for the formalities of getting ready a bill with drastic reductions in the metal schedule. The Steel Corporation's profits, which the Commissioner of Corporations finds to be much larger per ton than those of any other steel producer in the country, are made the criterion of the whole industry.

It cannot be said too strongly that this whole campaign against the Steel Corporation, which has been in full swing at Washington for these many months, promises to yield more net damage to other companies engaged in iron and steel manufacture than to the Steel Corporation itself. A tariff which would inflict no serious punishment on the Steel Corporation, with its exceptional advantages, represented in its annual reports by earnings of several dollars a ton more than the net yield per ton to its strongest competitor, might mean the taking of the very life blood of some of the smaller producers of iron and steel. We have already called attention to the anomaly of the Government's petition against the Steel Corporation founding its monopoly charge upon the corporation's policy of cooperating with its competitors—in other words, its failure to injure them by indiscriminately cutting prices. And now could there be stranger irony than a metal tariff whose net result may be the very harm to independent iron and steel producers which the Steel Corporation itself, on the assertion of the Department of Justice, has refused to inflict?

The Non-Cancellation of Machinery Contracts

The National Machine Tool Builders' Association and the National Supply and Machinery Dealers' Association are on record as favoring a non-cancellation clause in contracts for machinery. A large number of manufacturers have announced to their customers their attitude in the matter in a statement on their correspondence paper, but the movement has lost some of its zest because of the dullness which has characterized the market for the last year. The time is soon to arrive when a test of the principle must be made. If it is to be successfully carried through, full preparations must be made now, else buyers will not be familiar with the new condition and will perhaps resent a change which in this trade is radical. The establishment of a sound business basis as to contracts will mean an increased average of earnings.

The machinery people have always been exceedingly easy with their customers, who have never considered a contract to take certain machines at a certain time as a binding one. They have felt free to rescind orders, and most of the manufacturers and dealers have accepted cancellations with little protest, except sometimes where machinery was special in its nature, or where the work of construction was already well under way.

A committee of the National Machine Tool Builders' Association made a careful investigation of the question, and in an able and vigorous report persuaded the members that they had unnecessarily permitted themselves to be imposed upon by a custom which should never have had a beginning. The movement has made some progress, but has been lost sight of to a certain extent. The campaign of education, without which buyers cannot be impressed with the earnest intention of the trade, has not proceeded far enough. Much of this work must naturally fall upon the dealers. Their salesmen should keep in mind the fact that customers must be convinced that a new condition has been created, in order that they may know what to expect when business gets good again. In this way what may be called the "gambling" element of buying would be largely eliminated.

In times past, when all lines of manufacturers were exerting their utmost to increase their producing facilities, and quoted deliveries were running far into the future, it was a common occurrence, especially with some purchasing agents, to place orders for machinery with the understanding that they could be canceled if business conditions should change for the worse. Contracts were thus made to take care of possible needs at no risk to the buyer. Some salesmen fattened up their individual business by making private agreements to this effect. The result has been that orders which would have been carried through under any conditions of business were not booked because promise of reasonably early shipments could not be made. The gambling orders stood in the way.

If it shall be well understood that every order for a machine tool is a contract which must be carried out by the buyer, providing the manufacturer lives up to his end of the agreement, unless the dealer or manufacturer voluntarily cares to make an exception to the rule, the trade will be on a safer, more business-like basis. The manufacturers would not face the crisis resulting from a flood of cancellations which they have experienced in the past with a drop in demand. Instead of being left with a great stock of unfinished and finished product in their works and numerous canceled contracts, their customers would take the machines, and the falling off of production would be less abrupt and disturbing.

Sheet Mills and Steel Supply

The recent consolidation of two of the leading merchant blast furnaces in the Mahoning Valley and two of the larger independent sheet and tin plate mills into one company that will build a modern open hearth steel works at Youngstown, Ohio, is another example of the tendency of rolling mill companies to fortify themselves with their own supply of pig iron and steel. For three or four months in the latter part of 1911 sheets and tin plates were being sold at prices that even to the best equipped mills left little profit. Some manufacturers that buy their sheet bars in the open market probably sold their product in those months at an actual loss. No. 28 black sheets sold freely at 1.80 cents at maker's mill, and in some cases as low as 1.75 cents. A leading maker of sheets, whose costs are probably as low as those of any of the well equipped producers, has stated that at 1.80 cents he was not getting a new dollar for an old one.

With the enormous capacity of the new sheet and tin plate plant that has come on in the past three years, competition has grown very keen. Sheet and tin mill owners having no steel works connections have been made to realize the seriousness of their position when the market is not sustained by strong demand. They appreciate that as the trade has been drifting for some time they are not likely to get a fair return on their investment except in times of general prosperity. The small resistance shown by the sheet mills to the demoralizing tendencies of the past six months has been one of the outstanding facts in the whole situation. Not only was the decline in sheets greater than the general decline in steel products, but they had the unenviable distinction of actually selling below the low level of 1898. It indicates that the competitive idea is very much alive in the steel trade at large, that recourse must be had by the distressed sheet industry to the heaping up of further excess steel making capacity upon that which has so long existed. It is plain to be seen, however, that even a saving of $1 a ton in cost of steel by mills that have their own sources of supply is a great advantage over competitors depending on outside works for their bars and who are often not satisfactorily served in the matter of deliveries. An advantage also accrues to the sheet and tin plate mills that make their own steel in the fact that they are able to obtain regularity in quality and to adapt their steel works practice to the uses to which the finished product is to be put.

The promoters of the recent consolidation have proceeded on the belief that a company controlling all operations from the ore and pig iron up will be a factor in the trade when perhaps some of its competitors have been compelled to drop out of a race that is getting faster as time goes on. Another move in the same direction is reported from the Central West, where the building of an open hearth steel plant to supply semi-finished steel is being discussed by several makers of finished products, with good prospect that their plans will be carried out.

The Connecticut "Black-Listing Act"

A Test of Its Constitutionality by Machinery Manufacturers

The Connecticut black-listing act, so named on the statute books, is a matter of interest to manufacturers who are associated with labor bureaus, such as are maintained by various branches of the National Metal Trades Association. The secretary of the Manufacturers' Association of Hartford County, which includes the cities of Hartford and New Britain, was arrested and fined under the law, and the case will be carried through the state courts, and, if necessary, through the Federal courts, in order that a final precedent may be established. The prosecution was brought about by the association itself, in order to test the constitutionality of the act. The attitude of the manufacturers is set forth in the following letter addressed by the secretary of the association to the chief of the Bureau of Labor Statistics of Connecticut:

"I beg to acknowledge receipt of your favor of the 20th inst., which I understand to be a demand for a statement of the name of this association, of the exact business address of the bureau which it maintains, and of the names of all members of this association, or subscribers to said bureau. I also understand your letter to constitute a demand that you be allowed to inspect the records preserved in the bureau maintained by this association.

"It has been our policy in the past to permit all employees listed in this bureau to inspect the records pertaining to such employees, as a matter of courtesy. The same courtesy has heretofore been extended to the Labor Commissioner or other proper official. We are advised, however, that the State has no power to compel us to allow this inspection as a matter of right, and that Chapter 163 of the Laws of 1911, attempting to compel the allowance of such inspection, is unconstitutional. Acting under the instructions of this association, therefore, I refuse to comply with your demand, and decline either to furnish you with any information relative to the bureau maintained by this association, or the subscribers thereto, or to permit you to inspect the records preserved in such bureau."

Provisions of the Law

The statute is as follows:—

"An Act Concerning Blacklisting.

"SECTION 1. No person or corporation, nor any agent or attorney thereof, nor any association of persons or corporations, shall maintain, subscribe to, belong to, or support any bureau or agency conducted for the purpose of preserving and furnishing to any member thereof or to others information descriptive of the character, skill, acts, or affiliations of any person whereby his reputation, standing in a trade, or ability to secure employment may be affected, unless a complete record of such information shall be open at all reasonable times to the inspection of the person to whom such information relates, or his duly authorized agent or attorney. All items of information pertaining to each person so described shall be recorded, in reasonably clear and unambiguous terms, on a single sheet or card, and all records preserved in any such bureau or agency shall be at all times open to the inspection of the Commissioner of the Bureau of Labor Statistics. The name of the person or corporation, together with the names of the officers of any such corporation, conducting any such bureau or agency, the exact business address of such bureau or agency, and the name of every subscriber thereto or member thereof shall be furnished promptly to the Commissioner of the Bureau of Labor Statistics and by him recorded and preserved in a convenient form for public inspection.

"SEC. 2. Any person or corporation, or any officer or employee of any bureau or agency subject to the provisions of this act, who shall violate any of said provisions shall be fined not less than $50 nor more than $200 for each offense.

"SEC. 3. This act shall not apply to religious or charitable institutions maintained solely for humanitarian purposes; nor to agencies maintained solely for the purpose of vending employment and in which persons seeking such employment duly authorize the registration of their names and qualifications nor to companies, agencies or associations conducted solely for the purpose of preserving records and furnishing reports of financial standing and personal or business credit; nor to the private records of employees kept by any person or corporation to be used in accordance with the provisions of chapter 153 of the public acts of 1909."

The Manufacturers' Position

The manufacturers contend that these records and the information imparted from them are as privileged as those of the mercantile agencies, which the act specifically excludes from its provisions. It is not difficult to accept the argument that a workman's skill and general reputation are the equivalent of a financial credit. In practice, as the association's letter states, a man's record is open to his inspection. If his card shows, for example, that he has been discharged from one place of employment after another because of drunkenness, he very naturally does not think very highly of the system. The fact remains that the better classes of workmen, taking them as a whole, approve heartily of the co-operation which the bureau creates. It is highly probable that a ballot of the thousands of this type of man whose names are on the records of the Hartford County Association would be strongly in favor of the retention of the system. They like it for various reasons. The chance of finding employment is increased, and their periods of idleness are shortened correspondingly. The applicant, instead of tramping about the city, calling at one factory after another, goes to the central office and does not face the same degree of discouragement, and, in a sense, humiliation, of being rejected by a long succession of superintendents. The bureau gives the men this advantage at no cost whatever to them.'

As far as can be learned the only other similar law in this country is in the statutes of Missouri, and there it is a dead letter. But States follow one another in radical legislation, and the probability is that the Connecticut law will be copied. Therefore, it is desirable that its constitutionality be decided once for all, preferably by the United States Supreme Court. In Connecticut similar bureaus at New Haven and Bridgeport occupy the same relation to the act as does that of Hartford and New Britain.

Report of Great Northern Iron Ore Trustees

The trustees of the Great Northern Iron Ore properties have made public their report for the year ending December 31, 1911. The balance on hand at the end of the year was $1,572,073. Since September 16, 1907, the certificate holders have received a total of $7,500,000 in dividends or $5 a certificate. The report shows that only in the year 1911 did the United States Steel Corporation take out the minimum of ore called for under its lease, the required amount for that year being 3,750,000 tons. In that year an excess tonnage was mined, which absorbed the shortage for 1908, when no part of the minimum of 750,000 tons was taken out, and part of that for 1909, when the shortage was again the entire minimum, 1,500,000 tons. The total revenue from the Great Western Mining Company (Steel Corporation) to January 1, 1912, on 7,832,138 tons of ore was $14,820,398. Thus sum included an allowance of 80 cents a ton for freight to the docks. From other leases a total of $1,858,058 was received. Concerning the Steel Corporations notice to terminate its lease the report says:

"The notice given by the Great Western of its intention to terminate its lease on January 1, 1915, means that income from that lease will be discontinued from that date. While methods of handling the property subsequent to the termination of the lease are being perfected and put into operation, business prudence dictates that the reserves in hand should be maintained and increased as much as possible, to the end that the interests of the various companies should be conserved and made available for the ultimate benefit of the certificate holders."

"Analysis of a 'Heat' Tapped at Missouri Athletic Club by St. Louis Foundry Foremen's Association, Saturday, January 20, 1912," is the title printed on the first page of the menu card used on that occasion. A list of speakers and their subjects is given under "Physical Analysis" and the menu itself is put under "Chemical Analysis." The last page gives a list of the officers, who are called "Foremen of the Shop," while other members are named as "Helpers."

Steel Corporation Earnings in 1911

Total for 1911 Was $104,255,563, Against $141,054,754 in 1910

The statement of its earnings for the last quarter of 1911, just issued by the United States Steel Corporation, enables approximate figures for its total earnings of the year to be made up. Adding the results of the last quarter to those given for the previous quarter, the total is $104,255,563, showing a decrease of $36,799,191 on the earnings of 1910. The figures for 1911 may be changed slightly upon completion of the audit of accounts for the year. The quarterly statement of earnings given below compares the last quarter of 1911 with the last quarter of 1910:

	1911.	1910.
October, earnings	$9,159,338	$10,512,131
November, earnings	6,946,717	8,228,857
December, earnings	6,999,060	7,160,742
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, employees' bonus funds, and interest on bonds and fixed charges of the subsidiary companies	23,105,115	25,901,730
Less charges and appropriations for sinking funds on bonds of subsidiary companies and depreciation and replacement funds	3,126,594	5,528,518
Net earnings	19,978,521	20,373,212
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	5,751,680	5,816,640
Sinking funds for the quarter on U. S. Steel Corporation bonds—viz:		
Installments	1,012,500	1,012,500
Interest on bonds in sinking funds	547,783	482,822
Balance	12,666,558	13,061,250
Net adjustments in sundry accounts	81,780	67,731
	12,748,338	12,993,519
Dividend for the quarter on preferred stock, 1¾ per cent.	6,304,919	6,304,919
Dividend for the quarter on common stock, 1¼ per cent.	6,353,781	6,353,781
Surplus for the quarter	$ 89,638	$ 334,819

The balance of the surplus carried forward from previous quarters in 1911 was $4,645,824, which, added to $89,638, makes a total of $4,735,462 for the entire year. None of the quarterly reports issued for 1911 shows any appropriations for new construction.

Pittsburgh and Vicinity Business Notes

The Thomas Carlin's Sons Company, Pitsburgh, has received orders for shears for cutting up scrap, for shipment to Detroit and to Flint, Mich.

The United Engineering & Foundry Company has recently installed a considerable number of iron working tools in the press department of its Lloyd-Booth plant at Youngstown, Ohio.

The Seattle, Rentoa & Southern Railway Company has placed an order with the Westinghouse Electric & Mfg. Company, East Pittsburgh, for six double equipments of No. 317 motors, and the West Penn Railway Company has increased its equipment by an order for 302 E motors.

The annual meeting of stockholders of the Standard Underground Cable Company was held in Pittsburgh January 23, at which the old board of directors was re-elected. President Joseph W. Marsh stated that the company had had a very prosperous year. The new plant now being built in Canada is under roof and is expected to be ready for operation about May 1.

The Businessmen's Exchange has been organized at Meadville, Pa., and plans raising a fund of $75,000 to be used in securing small industries to locate there. Theodore Campbell is chairman.

The report that the Aluminum Company of America will build a new smelting plant at New Kensington, Pa., is untrue. An old building which covers the melting furnaces will be replaced with a building of better construction and adapted to telpherage or some other kind of handling of the metal to and from the furnaces. The company has no plans under way for new works in Tennessee. It owns an undeveloped water power in that State, but at present does not contemplate utilizing it.

A life size bronze bust of Andrew Carnegie was recently unveiled in the Margaret Morrison Training Schools at Pittsburgh.

The Pittsburgh Steel Company, Frick Building, Pittsburgh, operating an open-hearth steel plant and wire mills at Monessen, Pa., and which has started work on the erection of two blast furnaces at that place, has filed a complaint with the Interstate Commerce Commission protesting against 96 cents a ton freight rate on iron ore from Ashtabula, Ohio, to Pittsburgh. The complaint is directed against the Lake Shore, the Pittsburgh & Lake Erie and the Pennsylvania railroads. The company also protests against the present semi-finished material freight rate, naming other railroads, such as the Baltimore & Ohio, the Nickel Plate and the Big Four.

Stockholders of the Westinghouse Machine Company will hold a special meeting at East Pittsburgh March 29 to vote on a proposed increase in the capital stock and in the indebtedness. At present the company has outstanding $7,373,450 stock of an authorized issue of $10,000,000 and has outstanding $7,848,000 in bonds and notes.

The report that the Phillips Sheet & Tin Plate Company, Weirton, W. Va., which recently purchased the Pope Tin Plate Company at Steubenville, Ohio, will issue $2,000,000 in bonds is incorrect. The Bank of Pittsburgh recently purchased from the company bonds to the amount of $1,000,000, which represents all the increase in capitalization that the company intends to make at present.

In connection with the open-hearth steel plant which the Youngstown Sheet & Tube Company is now building at Youngstown, Ohio, the advisability of putting in a jobbing mill and plate mills is under consideration. In case the company decides to go into the manufacture of plates, it will make a full range of narrow and wide sizes and in longest lengths and up to the heaviest gauges. There may also be installed 8 and 10-in. hoop mills, but a decision has not been definitely reached.

The plant of the Washington Tin Plate Company at Washington, Pa., which has been practically rebuilt from plans of S. Diescher & Sons, engineers, Farmers' Bank Building, Pittsburgh, will likely be started this week. The old plant consisted of five hot tin mills, one of which was torn out and two new ones built, making it a six-mill plant. Electric traveling cranes and a good deal of other new equipment have been installed.

The H. Lange Wagon Company, Pittsburgh, has organized the Lange Motor Truck Company and will build a plant for the manufacture of one and two-ton motor trucks. The contract for the steel to be used in making the frames has been placed with the Jones & Laughlin Steel Company and the axles will be supplied by the Liggett Spring & Axle Company, Pittsburgh. It is stated that all the materials entering into the manufacture of the motor trucks to be built by this company will be bought from Pittsburgh makers.

The annual banquet of the Engineers' Society of Western Pennsylvania was held in the Fort Pitt Hotel on the evening of January 27, and was highly successful in every way.

The Center Foundry & Machine Company, Wheeling, W. Va., has received a contract for a large amount of steel castings for dams 41 and 48 on the Ohio River.

The Brown Engineering & Equipment Company, Machesney Building, Pittsburgh, has secured the agency in Ohio, West Virginia and Pennsylvania for the Burgmann engine packing.

At the annual meeting of stockholders of the Keystone Bronze Company, Pittsburgh, held January 23, the following officers were re-elected: Montgomery Murray, president; W. H. Schoen, vice-president; George Best, vice-president, and John S. Craig, secretary and treasurer. This company is a large factor in brass, bronze and copper castings, operating the Keystone works at Thirty-eighth and Thirty-ninth streets, Pittsburgh, and the Brighton works at New Brighton, Pa. Extensive improvements were made at both plants last year, and they are being operated full time.

The Iron and Metal Markets

Heavy Buying of Pipe Iron

Southern Furnaces Advance Their Prices

Eastern Steel Shipped to Pittsburgh—The Leading Producer Out of the Market on Billets and Sheet Bars

Statements concerning mill operations continue to be more impressive than those dealing with new orders for finished steel. Yet the aggregate of January bookings by the larger steel companies was not far from the total shipments, and in the Pittsburgh district in particular, specifications for semi-finished steel have been very heavy.

The position of the steel companies which went most aggressively after business in November and December is that they will be well occupied until late spring and meantime can hold the present status as to prices.

A surprising development is that one Pittsburgh interest, unable to supply a local plant with open hearth billets on which delivery was due, turned to an Eastern steel works, and there is thus the unusual occurrence of Eastern steel being shipped into the Pittsburgh district. There is also the probability that the leading interest will be a buyer of steel making pig iron if the present demand upon its Central Western plants for semi-finished steel keeps up in the next few weeks.

The Carnegie Steel Company is out of the market as a seller of billets, sheet bars and forging billets, having all the business it can take care of in the next three months.

The railroads have contributed quite heavily to the January business of the steel companies, at the same time sticking to the policy of holding back the last ton. Of the Pennsylvania order for 150,000 tons of rails the Steel Corporation gets 66,000 tons, the Pennsylvania Steel Company 33,000 tons, the Cambria Steel Company 32,000 tons, the Bethlehem Steel Company 7000 tons and the Lackawanna Steel Company 12,000 tons. The Grand Trunk has bought 10,000 tons, of which 7500 tons goes to Chicago mills and 2500 tons to Buffalo.

Railroad bridge work has figured largely in structural contracts this week, orders including 6500 tons for the Grand Trunk in New England, 5000 tons for the Delaware & Hudson and 3800 tons for the repair shops of the Boston & Maine.

While 22,000 tons of plates and shapes for the new battleships will be placed at Pittsburgh, mills in that district have declined about 30,000 tons of such steel offered by Eastern shipyards on the basis of a slight concession, and this business will go to Eastern works which are well able to take it on. The Newport News yard has placed 7000 to 8000 tons of plates and structural shapes in the past week. The exceptional position of the Pittsburgh district in recent operations is indicated by the fact that the structural bureau of the leading producer sent to the mills for rolling in January orders for 20,000 tons more of plates, shapes and car axles than in December.

The pipe and tube works of the Steel Corporation are now running to 90 per cent. of capacity. Late inquiries are for 40 miles of 12-in. line pipe for the Logan Natural Gas Company and for 25 miles of 16-in. line pipe for the Ohio Fuel Supply Company.

Chicago is making large demands upon cast iron pipe works. In the past week the city has placed 5000 tons; the local gas company has bought 20,000 tons, and next week the city will open bids for 25,000 tons. The St. Paul contract, 5000 tons, will go to a Virginia foundry. The pipe trade is much more active than at this time last year, and some makers have taken courage from recent contracts to ask slightly higher prices.

Due to the heavy buying of cast iron pipe, the placing of large pig iron orders by pipe foundries has caused a stiffening in the price of Southern iron. Alabama furnaces have just sold nearly 60,000 tons of No. 2, 3 and 4 iron to pipe works. At the same time production of foundry iron in Alabama has been cut down by the putting out of three furnaces, while a fourth is about to go on the idle list. No. 2 iron has been advanced to $10.25, Birmingham, by leading sellers. The weakness of Northern furnaces rather than the competition of Southern grades is still the chief obstacle to the establishment of a higher level.

Northern markets for foundry iron have settled further into quietness, and there is little prospect of an early buying movement. A Lake Erie furnace has sold 4000 tons of foundry iron that will be shipped into the Chicago district. The inquiry of the Westinghouse interests for foundry iron for the second half may not lead to business now. Furnacemen, after weary months of low prices, refuse to prolong the agony to the latter part of the year, while the buyer wants to-day's prices.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Jan. 31, 1912.	Jan. 24, 1912.	Dec. 27, 1911.	Jan. 25, 1911.
Pig Iron, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$14.85	$14.85	$14.85	$15.50
Foundry No. 2, Valley furnace	13.00	13.00	13.00	13.75
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace Chicago*	14.00	14.00	14.00	15.50
Basic, delivered, eastern Pa.	14.25	14.25	14.25	14.25
Basic, Valley furnace	12.25	12.25	12.25	13.25
Bessemer, Pittsburgh	14.90	14.90	15.15	15.90
Gray forge, Pittsburgh	13.40	13.40	13.40	14.15
Lake Superior charcoal, Chicago	16.00	16.00	16.00	17.50
Billets, etc., Per Gross Ton:				
Bessemer billets, Pittsburgh	20.00	20.00	20.00	23.00
Open hearth billets, Pittsburgh	20.00	20.00	20.00	23.00
Forging billets, Pittsburgh	28.00	28.00	26.00	28.00
Open hearth billets, Philadelphia	22.40	22.40	22.40	25.40
Wire rods, Pittsburgh	**25.00**	24.50	24.50	28.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	15.00	15.00	14.75	14.50
Iron rails, Philadelphia	*16.00*	16.50	16.00	17.00
Car wheels, Chicago	13.25	13.25	13.25	13.00
Car wheels, Philadelphia	12.00	12.00	12.50	13.00
Heavy steel scrap, Pittsburgh	*12.50*	12.75	12.50	13.50
Heavy steel scrap, Chicago	10.50	10.50	10.50	11.50
Heavy steel scrap, Philadelphia	*11.50*	12.00	12.25	12.50
Finished Iron and Steel, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.27½	1.27½	1.27½	1.32½
Iron bars, Pittsburgh	1.25	1.25	1.25	1.35
Iron bars, Chicago	1.15	1.15	1.15	1.30
Steel bars, Pittsburgh	1.15	1.15	1.15	1.40
Steel bars, tidewater, New York	1.31	1.31	1.31	1.50
Tank plates, Pittsburgh	1.15	1.15	1.15	1.40
Tank plates, tidewater, New York	1.31	1.31	1.31	1.56
Beams, Pittsburgh	1.15	1.15	1.15	1.40
Beams, tidewater, New York	1.31	1.31	1.31	1.56
Angles, Pittsburgh	1.15	1.15	1.15	1.40
Angles, tidewater, New York	1.31	1.31	1.31	1.56
Skelp, grooved steel, Pittsburgh	1.12½	1.12½	1.15	1.25
Skelp, sheared steel, Pittsburgh	1.20	1.20	1.20	1.30

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Coke, Connellsville, Per Net Ton, at Oven:	Jan. 31, 1912.	Jan. 24, 1912.	Dec. 27, 1911.	Jan. 25, 1911.
Furnace coke, prompt shipment.	$1.75	$1.75	$1.75	$1.40
Furnace coke, future delivery..	1.75	1.70	1.65	1.70
Foundry coke, prompt shipment	2.00	2.00	1.90	1.90
Foundry coke, future delivery..	2.10	2.10	2.15	2.25

Sheets, Nails and Wire, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.90	1.90	1.90	2.20
Wire nails, Pittsburgh	1.60	1.60	1.55	1.75
Cut nails, Pittsburgh	1.55	1.55	1.50	1.60
Fence Wire, ann'led, 0 to 9, P'gh.	1.40	1.40	1.35	1.55
Barb wire, galv., Pittsburgh	1.90	1.90	1.90	2.05

Metals, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	14.50	14.50	14.25	12.75
Electrolytic copper, New York.	14.25	14.25	14.12½	12.37½
Spelter, St. Louis	6.40	6.40	6.20	5.40
Spelter, New York	6.55	6.55	6.35	5.55
Lead, St. Louis	4.17½	4.37½	4.35	4.35
Lead, New York	4.25	4.45	4.45	4.50
Tin, New York	43.75	42.87½	45.25	43.25
Antimony, Hallett, New York..	7.55	7.55	7.60	7.25
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.64	$3.84

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb., New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.15c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.20 to 1.25
H-beams over 18 in.	1.30 to 1.35
Angles over 6 in.	1.20 to 1.25
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909	1.20 to 1.25
Tees, 3 in. and up	1.20 to 1.25
Zees, 3 in. and up	1.15 to 1.20
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.20 to 1.25
Deck beams and bulb angles	1.45 to 1.50
Hand rail tees	2.00 to 2.15
Checkered and corrugated plates	2.00 to 2.15

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.30 to 1.35
Nos. 9 and 10	1.40 to 1.45
Nos. 11 and 12	1.45 to 1.50
Nos. 13 and 14	1.50 to 1.55
Nos. 15 and 16	1.60 to 1.65

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.55 to 1.60	.....
Nos. 13 and 14	1.60 to 1.65	.....
Nos. 15 and 16	1.65 to 1.70	1.75 to 1.80
Nos. 17 to 21	1.70 to 1.75	1.80 to 1.85
Nos. 22, 23 and 24	1.75 to 1.80	1.85 to 1.90
Nos. 25 and 26	1.80 to 1.85	1.90 to 1.95
No. 27	1.85 to 1.90	1.95 to 2.00
No. 28	1.90 to 1.95	2.00 to 2.05
No. 29	1.95 to 2.00	2.05 to 2.10
No. 30	2.05 to 2.10	2.15 to 2.20

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11	1.90 to 1.95
Nos. 12, 13 and 14	2.00 to 2.05
Nos. 15, 16 and 17	2.15 to 2.20
Nos. 18 to 22	2.30 to 2.35
Nos. 23 and 24	2.40 to 2.45
Nos. 25 and 26	2.60 to 2.65
No. 27	2.75 to 2.80
No. 28	2.90 to 2.95
No. 29	3.00 to 3.05
No. 30	3.20 to 3.25

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Corrugated Roofing Sheets Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.00	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $25. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.40; galvanized, $1.70. Carload lots, to retailers, annealed, $1.50; galvanized, $1.80. Galvanized barb wire to jobbers, $1.90; painted, $1.60. Wire nails, to jobbers, $1.60.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	1.85	1.90	1.95	2.00	2.10	2.20	2.60	2.70

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from December 1, 1911:

Butt Weld.

	Black.	Galv.	Black.	Galv.
⅛ and ¼ in.	74	54	68	48
⅜ in.	75	65	69	59
½ in.	78	68	72	62
¾ to 1½ in.	81	73	75	67
2 to 3 in.	82	75	76	69

Lap Weld.

1¼ and 1½ in.	..	..	68	61
2 in.	79	72	72	65
2½ to 4 in.	81	74	74	67
4½ to 6 in.	80	72	73	65
7 to 12 in.	78	68	71	61
13 to 15 in.	55	..	47	..

Butt Weld, extra strong, plain ends, card weight.

⅛, ¼, ⅜ in.	70	60	65	55
½ in.	75	69	70	64
¾ to 1½ in.	79	73	74	68
2 to 3 in.	80	74	75	69

Lap Weld, extra strong, plain ends, card weight.

1½ in.	..	..	66	60
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50

Butt Weld, double extra strong, plain ends, card weight.

½ in.	65	59	60	54
¾ to 1½ in.	68	62	63	57
2 to 3 in.	70	64	65	59

Lap Weld, double extra strong, plain ends, card weight.

2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. Lap Weld

} Will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and standard charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Standard Charcoal Iron.*	
1¼ to 2¼ in.	65	1½ in.	48
2½ in.	67½	1¾ to 2¼ in.	50
2¾ to 3¼ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 5 in.	60
5 to 6 in.	67½	Locomotive and steamship special grades bring higher prices.	
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f. o. b. mill at Pittsburgh basing discounts, lowered by two points.

Pittsburgh

PITTSBURGH, PA., January 31, 1912. (*By Telephone.*)

Pig Iron.—There is a fair amount of new inquiry from small consumers who are taking in iron promptly—mostly foundry, a little Bessemer and basic. The Westinghouse Electric & Mfg. Company may not buy the foundry iron it inquired for. It is probable that if it could get as low prices for the last half as are ruling now, it would take a round tonnage, but furnaces are asking higher prices for that delivery. The asking price on Bessemer iron is $14.25 at Valley furnace, but not enough is being sold to test the market. A quotation of $14 at Valley furnace on a round lot of Bessemer for second and third quarter delivery has been made, but was turned down by the consumer. We quote: Bessemer, $14; basic, $12.25; malleable Bessemer, $12.75 to $13; No. 2 foundry, $13; gray forge, $12.50; all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel Billets and Sheet Bars.—The local market is quiet. We quote: Bessemer and open-hearth billets, 4 x 4 in., up to 0.25 carbon, $20; Bessemer and open-hearth sheet and tin plate bars, $21; forging billets, $28, all at Pittsburgh. Prices of billets and sheet bars at Youngstown are 50c. under Pittsburgh and on very desirable orders $1 under might be done.

Plates.—The Carnegie Steel Company will sign up a contract in a few days with the successful bidders to furnish the plates and shapes for the two new battleships. The Structural Bureau of the Carnegie Company, which handles plates, shapes, car axles, etc., reports that orders sent to the mills for rolling in January were about 20,000 tons heavier than in December.

Merchant Pipe.—The Logan Natural Gas Company, Pittsburgh, is in the market for 40 miles of 12-in. line pipe and the Ohio Fuel Supply Company, also this city, for 25 miles of 16-in., deliveries to be made about May. The Philadelphia Company, Pittsburgh, is in the market for 5000 tons of iron pipe and casings for delivery over all of 1912.

(By Mail.)

The Carnegie Steel Company has started up another Edgar Thompson furnace and now has 50 out of 59 furnaces in operation. Its open hearth steel plant at Sharon will be started this week and its Columbus Bessemer plant next week, when all of the steel plants of the company will be in operation for the first time in more than four years. The Sharon and Columbus steel works are always the first to be shut down when a period of depression starts. The Jones & Laughlin Steel Company has started a third Talbot open hearth furnace at Aliquippa. The greater activity seems to be among the large companies, some of the smaller concerns reporting that new trade so far this year has been very dull and that their specifications have shown a falling off as compared with December. Prices on the whole are fairly strong, but it is evident that the upward movement has stopped, and no further advances are looked for in the near future. The Carnegie Steel Company is out of the market as a further seller of steel billets and sheet bars, and reports that it is behind in deliveries. Its Mingo Junction steel plant has been practically down for a week or more on account of a break in machinery, but will be going again this week.

Ferromanganese.—Most consumers are covered and there is little new inquiry. The price of $41, Baltimore, on standard English 80 per cent. is still being quoted, but some resales are being made by local dealers at slightly lower prices. A sale of two cars, or about 50 tons, February-March delivery, is reported at $40.50, Baltimore. The rate to Pittsburgh is $1.95 a ton.

Ferrosilicon.—Now that the Carnegie Steel Company has covered its requirements for this year there will likely be little new inquiry for some time. Prices are reported to be a shade weaker. We quote small lots of 50 per cent. at $70; 100 to 500-ton lots at $69, and over 500 tons at $68, Pittsburgh. The lower grades have gone off in price, and we quote 10 per cent. at $20; $11 per cent., $21, and 12 per cent., $22, f.o.b. cars at furnace, Jackson, Ohio, or Ashland, Ky.

Muck Bar.—A sale of 500 tons to a consumer outside the city is reported for February-March delivery on the basis of about $28, Pittsburgh. The local market is dull and we quote best grades, made from all pig iron, at about $28, Pittsburgh.

Wire Rods.—New inquiry is light. A local maker reports a sale of 200 tons of open hearth rods for February delivery at $25, Pittsburgh, and we quote Bessemer, open hearth and chain rods at this price.

Skelp.—No sales are reported and local inquiry is quiet. We quote grooved steel skelp at 1.12½c.; sheared steel skelp, 1.20c.; grooved iron skelp, 1.42c. to 1.45c., and sheared iron skelp, 1.62½c. to 1.65c., all for delivery at buyer's mills in the Pittsburgh district.

Steel Rails.—In the distribution of the Pennsylvania Railroad order the Steel Corporation got about 55,000 tons, mostly open-hearth rails, the greater part of which will be rolled at South Chicago. The Carnegie Steel Company has received an order for 18,000 tons from the Erie Railroad and is also reported to have booked 6400 tons for the Pittsburgh & Lake Erie, a subsidiary of the New York Central. The demand for light rails is fairly large, the Carnegie Steel Company having taken new orders and received specifications against contracts last week for about 2500 tons. A large tonnage of splice bars is pending and will be placed in a short time. We quote splice bars at 1.50c. per lb., and repeat quotations on rails: Standard sections, 1.25c. per lb.; 8 and 10-lb. light rails, 1.25c.; 12 and 14-lb., 1.16c.; 16, 20 and 25-lb., 1.12c.; 30 and 35-lb., 1.10c., and 40 and 45-lb., 1.08c., f.o.b. at mill.

Structural Material.—Inquiries have been much more active. The McClintic-Marshall Construction Company has taken about 4000 tons of plain material for new shops for the Boston & Maine Railroad. The American Bridge Company has taken 3500 tons for a new office building in the East and about 1500 tons for a hotel. The two local mills are holding plain material up to 15 in. at 1.15c. for the ordinary run of orders, but on very desirable specifications 1.10c. is being done. Small lots are held at 1.20c. to 1.25c. at mill, the price depending on the amount of material involved and the deliveries wanted.

Plates.—The plates and shapes for the two new battleships, involving about 22,000 tons, have not yet been placed, but are expected to come to a local mill. The armor plate for these vessels, being much heavier than usual, amounting to about 15,000 tons, has been equally divided among the Carnegie, Bethlehem and Midvale companies. The armor plate department of the Homestead works of the Carnegie company is now pretty well filled for the next 18 months. No contracts for steel cars were placed in the past week, but pending inquiries include 2500 for the Bessemer & Lake Erie, 1500 for the Chicago, Milwaukee & St. Paul, 8000 for the Santa Fé, 1000 for the Norfolk & Western and about 2500 for the Western Maryland. We quote ¼ in. and heavier plates at 1.15c. at mill, but on very desirable contracts 1.10c. is being done.

Sheets.—Makers report that specifications against contracts continue to come in at the regular rate and all indications are that shipments this month will be fully as heavy as in December, which, by the way, was one of the heaviest months in the history of the sheet trade. The new demand is quiet and as a rule only for small lots for early shipment. The leading mills are now operating at 80 to 85 per cent. of capacity, while a few mills are running practically full. The American Sheet & Tin Plate Company is now operating seven sheet mills, two jobbing mills and the 72-in. plate mill at Gary, Ind. Prices on black sheets are slightly weaker and in some cases, on desirable orders, 1.85c. at mill is being named.

Tin Plate.—Specifications against the heavy contracts placed last fall are coming in freely and shipments are heavy. The mills generally are operating at about 80 per cent. of capacity. Only small scattering orders are being placed. We quote 14 x 20 coke plates at $3.40 per base box for small lots f.o.b., Pittsburgh. On desirable orders some mills are quoting $3.30.

Iron and Steel Bars.—The new demand for both iron and steel bars continues dull. Specifications on contracts so far this month have been somewhat disappointing, but this is attributed largely to the extremely cold weather which has checked consumption. The steel bar mills are pretty well filled through the first quarter. We quote steel bars at 1.15c. to 1.20c for de-

very in first quarter and iron bars at 1.25c. to 1.30c. f.o.b. at mill, Pittsburgh.

Hoops and Bands.—The new demand is quiet, but specifications are reported as coming in at a satisfactory rate. We quote steel bands at 1.15c., extras as per the steel bar card, and hoops at 1.25c., for delivery in first quarter, f.o.b. Pittsburgh.

Rivets.—A fair amount of new orders is being placed, and specifications against contracts are quite good. We quote structural rivets at 1.50c. and boiler rivets at 1.60c. f.o.b. Pittsburgh, but these prices are shaded on very desirable orders.

Shafting.—Two local makers report that specifications from implement makers and automobile builders have been coming in the past week at a better rate than for some time. We quote cold rolled steel shafting in carload and larger lots at 65 per cent. off and in small lots at 60 and 5 per cent. off, delivered in base territory. On very desirable contracts these prices are slightly shaded.

Spelter.—Shipments are fairly heavy and prices steady. We quote prime grades of Western at 6.35c. East St. Louis for spot shipment, equal to 6.47½c. Pittsburgh.

Wire Products.—Mills report that the recent advance is stimulating specifications on contracts to some extent, but the new demand is dull and likely to continue so for the next month or two. We quote wire nails, $1.60; cut nails, $1.55; galvanized barb wire, $1.90; painted, $1.60; annealed fence wire, $1.40, and galvanized fence wire, $1.70, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Pipe.—Several of the larger makers report that actual orders sent to the mills for rolling this month were fully as heavy as in December and 20 per cent. larger than in January last year. An inquiry is in the market for 40 miles of 12-in. line pipe and the order will probably be placed within a few days. Low prices have recently been made on line pipe, in some cases close to cost, but two of the leading mills have withdrawn such figures and are now quoting higher prices. Regular discounts on iron and steel merchant pipe, quoted on a previous page, are reported as being well maintained.

Tubes.—Specifications on locomotive tubes against the heavy contracts placed during November and early December at very low figures are coming in quite freely but new demand is dull. Merchant tubes are quiet and prices are still shaded materially.

Iron and Steel Scrap.—The local consumer that has been buying quite freely of heavy steel scrap is still picking up odd lots at $12.75 and $13, most of this material being for delivery at its South Side mills. The general market is quiet and prices are weak, lower figures being named on heavy steel scrap borings and turnings. We note sales of 500 tons of heavy steel scrap of special grades at $12.75, delivered, and 300 tons of ordinary grades at $12.50, delivered. Dealers quote as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pittsburgh delivery	$12.50 to $12.75
No. 1 foundry cast	12.50 to 12.75
No. 2 foundry cast	10.25 to 10.50
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.75 to 11.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to 12.75
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	9.00 to 9.25
Low phosphorus melting stock	15.25 to 15.50
Iron car axles	20.50 to 21.00
Steel car axles	16.00 to 16.25
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
Old car wheels	12.00 to 12.25
*Cast iron borings	9.75 to 9.85
*Machine shop turnings	9.75 to 10.00
†Sheet bar crop ends	13.75 to 14.00
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	12.00 to 12.25
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.00 to 9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping pound.

Coke.—Conditions in this trade are improving to some extent, the new demand being fairly heavy and shipments larger than for some time. The output of coke in the Upper and Lower Connellsville regions last week is estimated at over 400,000 tons, the highest output reached in any one month in more than a year. The supply of furnace coke is larger and prices on prompt coke are slightly lower. We quote standard grades of furnace coke at $1.75 to $1.80 and 72-hr. foundry for prompt shipment at $2 to $2.10 per net ton at oven.

Chicago

CHICAGO, ILL., January 30, 1912.

The past week failed to develop any pronounced trend in the market. Interest attached to the announcement from Southern furnaces that an advance in the price of No. 2 at Birmingham to $10.25 had been made by important makers. The advance is attributed not only to the movement of iron during the past 60 days but also by the shutting down of several additional stacks in the South. Cast-iron pipe interests have been large buyers of pig iron and in turn have taken large contracts for pipe. The United States Cast Iron Pipe & Foundry Company has closed for 25,000 tons of gas and water pipe in Chicago and an additional 25,000 tons will be placed in the coming week. It is stated that unsettled matters connected with the Northwestern Lines rail contracts for 60,000 tons are now completely arranged. Additional contracts for between 13,000 and 14,000 tons are reported placed with the local mills. In other finished steel lines specifications continue to be received in liberal volume. The absence of additional new business is attributed in some quarters to the fact that many of the contracts placed at the end of last year cover requirements for the first half. At the local plants of the Steel Corporation seven Gary furnaces out of eight are in operation; at South Chicago, six out of eleven, and at Joliet, three out of four. With the exception of the rail mills all of the finishing mills are running. In the matter of prices, such advances as have been made from the low points, averaging about $1 a ton, are being maintained, but this is the most that can be said. Local mills continue to take the major portion of the business in this territory to the exclusion of Eastern producers. Additional contracts for cars placed in the past ten days have been unimportant and the requirements of the Harriman lines and the Santa Fé are the most important remaining unfilled.

Pig Iron.—A fair tonnage of both Northern and Southern irons has been bought in this market in the past week. The satisfactory features of this buying are that melters are taking their iron promptly and that purchases are almost entirely against orders for castings. A local foundry bought 2000 tons of Southern iron and another inquiry for a like amount is reported. One interest placed over 3000 tons of Northern iron, largely charcoal iron, at the close of last week. The market indications are that melters generally covered for their normal requirements in the buying movement of November and December. Local iron is quoted at $14, f.o.b. furnace, with no immediate prospect of an advance. Southern furnaces feel sufficiently well intrenched to ask an advance of 25c. a ton and in one or two instances 50c., so that while it may still be possible to buy No. 2 Birmingham iron at $19 under favoring circumstances the general market is at the level of $10.25. This position is made the stronger because of the blowing out of a Clifton, Woodstock (within a week or two) and a Vanderbilt stack. We continue to quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.00 to $16.50
Northern coke foundry, No. 1	14.50
Northern coke foundry, No. 2	14.00
Northern coke foundry, No. 3	13.50 to 14.00
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.85
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.35 to 14.50
Standard Bessemer	16.75
Basic	14.75
Jackson County and Kentucky silvery, 6 per cent.	16.40
Jackson County and Kentucky silvery, 8 per cent.	17.40
Jackson County and Kentucky silvery, 10 per cent.	18.40

Rails and Track Supplies.—Specification details of the Northwestern Lines' order of 60,000 tons of rails placed with the local mills have finally been settled. The Grand Trunk is also understood to have placed an order for 10,000 tons and the Soo line has increased its contracts to a total of about 22,000 tons. Specifications for track fastenings are of good volume. We quote standard railroad spikes at 1.50c., base; track bolts, with square nuts, 1.90c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c., Chicago.

Structural Material.—The demand for structural shapes for architectural purposes shows little change for the better, and fabricators' bids for such work as is offered are frequently exceedingly low. Contracts for fabricated steel reported during the week aggregated about 2500 tons, including a draw-span of 692 tons for the St. Louis Southwestern Railway Company, awarded to the Wisconsin Bridge Company; 162 tons for a New Orleans high school, awarded to the Louisiana Bridge Company; deck girder turntables for the Texas & Pacific Railway Company, 165 tons, to the American Bridge Company; Public Service office building at Los Angeles, Cal., 665 tons, to the Llewellyn Iron Works, and 216 tons for a shaft house and crusher building for the Munro Mining Company, Iron River, Mich., awarded to Worden-Allen Company. Reports of a shading of the price of 1.30c., delivered Chicago, for structural steel can be confirmed as to business considered especially desirable, but the above quotation is the ordinary minimum, and we quote for mill shipment, Chicago delivery, 1.30c. to 1.38c., and from store 1.60c.

Plates.—New orders and contracts for plates are only a very small portion of the current business, which is for the most part made up of specifications against contracts already reported. Additional car orders are comparatively few and include among those recently placed 550 hopper cars for the Chicago & Northwestern, and a number of passenger coaches for several of the Western railroads. Quotations for plates show practically no change, but efforts to obtain higher prices are almost entirely without success. We quote for Chicago delivery, mill shipment 1.30c. to 1.40c., and from store 1.60c.

Sheets.—Local mills continue to absorb practically all of the business in sheets in this territory, and as an evidence of the prevalence of unsatisfactory prices but very little business goes elsewhere than to the mills controlling their own raw and semi-finished materials. Carload business still brings out minimum quotations and higher prices go begging. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.03c. to 2.08c.; No. 28 galvanized, 3.03c. to 3.08c.; No. 10 blue annealed, 1.53c. to 1.58c. Prices from store, Chicago, are: No. 10, 1.90c.; No. 12, 1.95c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—Conditions remain as they have been throughout the month. Steel-bar tonnage is generally plentiful in the form of specifications, with prices uniformly ranging between 1.25c. and 1.30c., Chicago. Bar iron business is largely routine, with mills operating at somewhat better than half their capacity. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.25c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.15c. to 1.20c. From store: Soft steel bars, 1.50c. to 1.55c., Chicago.

Old Material.—Although the lack of transactions and the general quietness of business in the local market for scrap have obscured somewhat the trend of the situation, the prevailing note is undoubtedly one of weakness. Of the railroad offerings of scrap mentioned a week ago portions were not sold and the average quotations were lower than for the preceding lists. The only new list current is from the Rock Island, carrying about 1000 tons. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.

Old iron rails	$15.00 to $15.50
Old steel rails, rerolling	12.75 to 13.25
Old steel rails, less than 3 ft.	11.75 to 12.25
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	13.25 to 13.75
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.00 to 10.50
Steel axle turnings	8.50 to 9.00

Per Net Ton.

Iron angles and splice bars	$12.75 to $13.25
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Steel knuckles and couplers	10.00 to 10.50
Steel springs	10.50 to 11.00
Locomotive tires, smooth	13.00 to 13.50
Machine shop turnings	6.75 to 7.25
Cast and mixed borings	6.00 to 6.50
No. 1 busheling	9.00 to 9.50
No. 2 busheling	6.25 to 6.75
No. 1 boilers, cut to sheets and rings	7.00 to 7.50
Boiler punchings	12.50 to 13.00
No. 1 cast scrap	11.00 to 11.50
Stove plate and light cast scrap	9.25 to 9.75
Railroad malleable	10.50 to 11.00
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Wire Products.—With but few exceptions the country demand for fencing wire and manufactured fence is up to expectations. The requirements of manufacturers for plain wire are also up to the average. Mills rolling wire rods in this territory are running full. In accordance with the advance reported a week ago we continue to quote as follows: Plain wire, No. 9 and coarser, base, $1.58; wire nails, $1.78; painted barb wire, $1.78 to $1.83; galvanized, $2.08; polished staples, $1.83; galvanized, $2.13, all Chicago.

Cast Iron Pipe.—The buying of pipe for laying in the spring has brought heavy tonnages into the market, both for municipal water systems and for gas mains. At Chicago, the city bought last week 5000 tons of water pipe and the local gas company placed its contract for 20,000 tons of gas pipe. The city will open bids on February 6 for 25,000 tons additional. A decision is being made to-day as regards the awarding of 5000 tons at St. Paul. At Council Bluffs, Iowa, 600 tons of pipe was purchased and 1500 tons at Spokane, Wash. Prices are somewhat firmer and our quotations have been revised to show an advance of 50c. a ton. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $27; 6 to 12-in., $25; 16-in. and up, $24.50, with $1 extra for gas pipe.

Philadelphia

PHILADELPHIA, PA., January 30, 1912.

The Pennsylvania Railroad Company has made formal allotments against its 1912 rail requirements, understood to aggregate 150,000 tons, and now has inquiries out for 10,000 to 12,000 tons of splice bars. Some orders for materials entering into ship construction have been placed and important inquiries are still being figured on. Little fresh inquiry for either foundry or steel making grades of pig iron has appeared. Cast-iron pipe makers have placed orders against some of their recent inquiries. A little business in basic iron has also been done. The demand for both iron and steel bars drags. Old materials are weaker, and prices of a number of grades are quotably lower.

Iron Ore.—There is an absence of any important sales. Negotiations are pending for several good lots of foreign ore, but business closes slowly. Importations during the week include 18,029 tons of Swedish and 5550 tons of Cuban ore.

Pig Iron.—Sales of foundry grades have been confined to small lots, few exceeding 100 tons, mostly for urgent delivery, at prices ranging from $14.85 to $15.25 for eastern Pennsylvania No. 2 X, delivered in this vicinity. No large inquiries have developed recently and the trade looks forward to rather quiet buying, at least as far as the near future is concerned. Cast-iron pipe makers have placed orders against recent inquiries for low grade iron; one melter has taken 2000 tons of Southern and 3000 tons of Northern, for April-May delivery, and several smaller lots of off-grade iron have also been taken by other pipe makers, who would make more extensive purchases if prices to their liking were available. The Virginia interest which was inquiring for 10,000 tons of low-grade iron has not yet closed. Sales of the higher grades of Virginia foundry have been lighter and inquiry is also less pronounced; transactions range from carloads to lots of a few hundred tons at $12.25 to $12.50, at furnace. Conflicting reports as to sales of basic iron are heard. The most active inquiry recently has been from the Harrisburg district, and rumors of sales of eastern Pennsylvania iron, ranging from 5000 to 7000 tons, are heard, but lack confirmation. It is also said that sales of Southern basi have been made to the same interests. Reports of lower prices are current in connection with these transactions. The only actual transaction reported in eastern Pennsylvania basic is one of several thousand tons, for early delivery, at close to $14.25, delivered. Makers of this grade of iron in the eastern Pennsylvania district are confronted with a decidedly narrower market; not only is consumption light, but the number of consumers purchasing in the open market has decreased. It is said that some of the furnaces which have been large basic producers must either turn to foundry, for which there is little demand at this time, or curtail production. Small sales of low phosphorus iron continue to be made at unchanged prices. One large inquiry, previously reported, is still before the trade. While transactions in rolling-mill grades of forge iron are light, an inquiry for 1000 tons is noted, as is also one for 600 tons of charcoal iron, for special work. Prices show no change, makers contending that absolute bottom has been touched, while they admit

that in view of the light demand no advance is possible. The following range represents quotations for standard brands, delivered in buyers' yards in this district:

Eastern Pennsylvania No. 2 X foundry	$14.85 to $15.25
Eastern Pennsylvania No. 2 plain	14.60 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.25 to 14.50
Standard low phosphorus	19.00 to 19.50

Ferroalloys.—Inquiry is extremely meager. Occasional carload lots of 80 per cent. ferromanganese come out for quick delivery, such sales being made at $41, Baltimore. Several carloads of 50 per cent. ferrosilicon have been sold at $70, delivered in this vicinity. Furnace ferrosilicon, within Bessemer limits as to phosphorus and sulphur, is quoted at $24.30 to $26.30, delivered, but little business is moving.

Billets.—A moderate volume of business continues to be taken by Eastern mills. Sales of basic open-hearth rolling billets, in lots of 500 tons upward for early delivery, have been made at $22.40, delivered here, while as high as $23 is obtained for small orders. While the demand for forging billets is not as active as it was, moderate orders have been taken at $26.40 to $27.40, according to specification and analysis. Mills do not show any increase in activity but are able to about hold their recent productive rate.

Plates.—Current demand does not show any marked improvement. In instances specifications have been better and mills have been able to hold their productive rate. While some mills refuse to contract, others have taken business for delivery over six months, one Eastern shipyard having entered such a contract during the week. Bids are in on a large amount of boat work, but no definite orders have been placed. A moderate business in tank plates is moving, with an occasional inquiry for a round lot. Prices show no change, 1.30c. to 1.35c., delivered here, being named for the general run of business.

Structural Material.—Several contracts for small buildings and bridges have been closed, the tonnage of materials required being in but few cases in excess of several hundred tons. The new Municipal Convention Hall, plans for which are now out, will be largely of timber construction, being only of a temporary character. Bids are going in against the new Manufacturers' Club. Contracts have not yet been awarded for the Bellevue-Stratford addition, while the Stock Exchange Building is still held up. Plans for the new Lasher manufacturing building, at Broad and Wallace streets, are assuming more definite shape, but not far enough advanced to state the quantities of structural material required. A large amount of business in boat shapes is being figured on. Current business in plain shapes is reported less active. Prices are unchanged, 1.30c. to 1.35c. being named for delivery in this district.

Sheets.—A very fair run of current small orders is reported. Occasional contracts are entered, but Eastern makers are confining sales largely to prompt deliveries and are able to keep mills fully supplied with orders of that character. Prices are firm, Western sheets being quoted at 2.05c., delivered here, for No. 28 gauge, while Eastern mills making smooth, loose rolled sheets easily obtain an advance of ¼c. to ½c. per lb. over that basis.

Bars.—While mills are fairly well engaged on orders in hand, current sales are small and prices have not been seriously tested. The better grades of iron bars are firmly held at 1.20c., Eastern mill, or 1.27½c., delivered here, although on ordinary bars this price can be shaded. The demand for steel bars is light; mills maintain quotations at 1.30c., delivered here, although reports of slight concessions by merchants are sometimes heard.

Coke.—Unfavorable conditions at the ovens continue to have an influence on the market. Irregularity in deliveries has also handicapped some consumers and urgent requests for more rapid shipment are frequent. A spotty demand for both furnace and foundry grades is noted, with small and moderate lot transactions at unchanged prices. For either prompt or forward delivery $1.75 to $1.85, at oven, is named for furnace grades, and $2.10 to $2.30 for foundry grades. The following range of prices, per net ton, is named for deliveries in this district:

Connellsville furnace coke	$3.90 to $4.00
Foundry coke	4.15 to 4.50
Mountain furnace coke	3.65 to 3.75
Foundry coke	3.95 to 4.40

Old Material.—Small sales are reported in some grades, usually at lower prices. The market is weak, and prices on practically all kinds of scrap show a further recession. Mills either take no interest in the market or offer materially lower prices, and some orders have been placed at prices well under recent quotations. No. 1 wrought scrap has been bought from $14.75 down to $14, delivered. No. 1 heavy melting steel is dull and sellers report it difficult to find a buyer at $12, delivered. The following range of prices about represents quotations at which ordinary current business for prompt shipment can be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$11.50 to $12.00
Old steel rails, rerolling (nominal)	14.00 to 14.50
Low phosphorus heavy melting steel scrap	15.50 to 16.00
Old steel axles	17.00 to 17.50
Old iron axles (nominal)	22.00 to 23.00
Old iron rails	16.00 to 17.00
Old car wheels	12.00 to 12.50
No. 1 railroad wrought	14.00 to 14.50
Wrought iron pipe	11.50 to 12.00
No. 1 forge fire	9.75 to 10.25
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.00 to 9.50
Cast borings	8.00 to 8.50
Machinery cast	13.00 to 13.50
Railroad malleable (nominal)	11.75 to 12.25
Grate bars, railroad	10.00 to 10.50
Stove plate	9.50 to 10.00

Marshall, Matlack & Co., pig iron and coke merchants, 1119 Pennsylvania Building, have moved their offices to suite 615 in the same building.

Rogers, Brown & Co., pig iron merchants, Pennsylvania Building, have been appointed exclusive selling agents for the charcoal pig iron made at Muirkirk furnace, Muirkirk, Md. This furnace, which has a capacity of 20 tons a day, has been idle for a year, but will be blown in about February 15.

Cleveland

CLEVELAND, OHIO, January 30, 1912.

Iron Ore.—A few reservations of 1912 ore have been made in the week but there are no indications that consumers generally will be ready to buy for some time. Lake Superior ore sellers, while closely watching conditions, have as yet made no thorough canvass of the situation with a view to determining the basis for 1912, and it probably will be some time before the season's prices on ore are announced. We quote as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market is generally quiet. Some small lot sales of foundry grades are being made, but new inquiries are very light. Some business in round lots that has been pending has not yet been placed. Of the tonnage bought by the Laporte, Ind., implement manufacturer, 4000 tons of Northern foundry iron went to a Cleveland seller for shipment from its Lake Erie furnace. The inquiry of the Westinghouse Electric & Mfg. Company for last half delivery is still pending. While showing hesitancy about naming prices for such delivery Cleveland furnace interests will probably quote on about 3000 tons required for the company's Cleveland plant. We note the sale of one 1800-ton lot and one 300-ton lot of Southern charcoal iron. There is one new inquiry for 2000 tons of Northern foundry iron. A central Ohio consumer is in the market for 1000 tons of Lake Superior charcoal iron. Another central Ohio consumer wants 500 tons of malleable. Prices on Northern foundry iron are firm and unchanged. The general quotation for No. 2 foundry is $13.25, Valley. However, one Cleveland furnace is naming lower prices for outside shipment. Recent heavy sales of Southern iron have resulted in the stiffening of prices, although $10 iron has not disappeared. A northern Ohio inquiry for 3000 tons of No. 2 Southern, noted last week, is still pending. We quote the following prices for prompt shipment and for the first half, delivered Cleveland:

Bessemer	$14.90 to $15.15
Basic	13.25
Northern foundry No. 2	$13.25 to 13.50
Southern foundry No. 2	14.35 to 14.85
Gray forge	12.50
Jackson County silvery, 8 per cent. silicon	17.05

Coke.—The market is quiet but prices are firm. There is no demand for contract coke. The only activity is in small lots of foundry grades for early shipment. We quote standard Connellsville furnace coke at $1.90 to $2 per net ton at oven for spot shipment and contract. Standard Connellsville foundry coke is held at $2 to $2.15 for spot shipment and $2.15 to $2.40 for contract.

Finished Iron and Steel.—Business in finished lines is generally quiet. Mills are getting a moderate volume of new orders but these are for quite small amounts. Bar consumers recently specified quite heavily on contracts. As a result current specifications are only fair. Steel bars are firm at 1.15c., Pittsburgh. Demand for iron bars is not active. Both local mills are running but they have only a small tonnage on their books. We quote iron bars at 1.20c., Cleveland mill. Plate orders are not numerous. Prices are unchanged at 1.15c. to 1.20c., Pittsburgh, the lower price more generally representing the market. The demand for structural material is not active. Very little new work in building lines is in prospect in the near future, and railroads in this territory have not as yet made any announcement of their requirements for bridge construction work during the present year. The only structural contract of any size placed in the past week was for 600 tons for the W. G. Marshall 12-story building to be erected on the Public Square, Cleveland, to replace a building recently burned. This contract went to the Forest City Steel & Iron Company, Cleveland. Sheet specifications are fairly good but very little new business is coming out. There are rumors that sheet prices are being shaded, but no new orders of sufficient size to test the market have developed.

Old Material.—There is practically no demand for any grade of scrap. The inactivity has resulted in the weakening of all prices. However, in the absence of actual transactions the quotations generally are unchanged, although sales on most grades would probably be made at 25c. to 50c. below nominal quotations. Heavy steel scrap is quite generally offered at $11.50, but local consumers are well supplied and will not buy at present except at lower prices. The Wheeling & Lake Erie Railroad closed Tuesday on a small list. The Pennsylvania Railroad has a large list on which bids will close February 6. Dealers' prices, f.o.b. Cleveland, are as follows:

Per Gross Ton.

Old steel rails, rerolling	$12.25 to $12.75
Old iron rails	14.00 to 14.50
Steel car axles	17.50 to 18.00
Heavy melting steel	11.25 to 11.50
Old car wheels	12.00 to 12.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.75 to 12.00
Light bundled sheet scrap	9.50 to 10.00

Per Net Ton.

Iron car axles	$18.50 to $19.00
Cast borings	6.25 to 6.50
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	7.25 to 7.75
No. 1 busheling	9.50 to 10.00
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	11.25 to 11.75
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

The offices of the Upson Nut Company, Cleveland, will be moved on February 5 from the Garfield Building to the seventh floor of the Hickox Building, the offices of the connected interest, the Bourne-Fuller Company, being in that building.

The Carnegie Steel Company on January 29 moved its Cleveland offices from the sixteenth floor of the Rockefeller Building to more commodious quarters on the third floor of the same building.

Cincinnati

CINCINNATI, OHIO, January 31, 1912.—(*By Telegraph.*)

Pig Iron.—Southern producers now occupy a stronger position. The curtailment in production has helped materially in cutting down stocks, and several furnaces that were formerly eager for prompt shipment, as well as first half business, on a basis of $10, Birmingham, for No. 2 foundry, have withdrawn this quotation and are asking a premium of 25c. to 50c. a ton for any shipment before July 1. However, consumers in this territory continue very indifferent customers, and the bulk of sales consummated cover only carload to 200-ton lots. Better reports are received from other districts. Southern charcoal iron has recently had quite a spurt of activity, and among the latest orders booked is one from a Pennsylvania melter who took 1200 tons at $22, Birmingham, for February-March delivery. Dealers also report a number of scattered orders for the lower grades of Southern foundry iron, and one small lot of gray forge was taken by a nearby melter at $9.50, Birmingham. Northern foundry and malleable are both stagnant at $13, Ironton. A few large Eastern melters are feeling the market for prices on third and fourth quarter deliveries, and one large interest is understood to be willing to close for a round tonnage if the furnaces will meet prevailing quotations. Both ferrosilicon and ferromanganese are said to be in slightly better demand. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$13.75 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.45 to 16.95
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.25 to 25.50
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Business is very quiet in all three districts, but producers are holding prices up to the same level of previous reports, and 72-hr. brands are probably a trifle higher. It is reported that some Connellsville furnace coke has brought as high as $1.95 to $2 for spot shipment, although only very small urgency lots were taken at these figures. The regular contract quotations on 48-hr. coke in the Connellsville, Pocahontas and Wise County districts range from $1.70 to $1.90 per net ton at oven, with 72-hr. brands bringing all the way from $2.10 to $2.40 for future shipment.

Finished Material.—There is no special activity in any line, and the market is drifting along, with no signs of reviving at any early date. Mill quotations are steady and local warehouse prices are unchanged. Orders with undesirable specifications for structural material and steel bar sizes are difficult to book below 1.20c., Pittsburgh basis, but the regular market quotation is 1.15c. at mill. The warehouse quotation on steel bars is 1.60c., and on structural material 1.70c. New business in sheets is coming in rather slowly, but shipments on old contracts are moving along in a satisfactory manner.

Old Material.—There is considerable complaint by dealers over the slackening demand for practically all kinds of scrap material. With the exception of cast borings, for which there has been lately a better call, there is little to report. The minimum figures given below represent what buyers are willing to pay for delivery at their yards in southern Ohio and Cincinnati, and the maximum quotations the selling prices, f.o.b. at yards:

Per Net Ton.

No. 1 railroad wrought	$9.75 to $10.25
Cast borings	5.25 to 5.75
Steel turnings	5.50 to 6.00
No. 1 cast scrap	10.00 to 10.50
Burnt scrap	6.50 to 7.00
Old iron axles	16.00 to 16.50
Locomotive tires (smooth inside)	11.50 to 12.00
Pipe and flues	7.00 to 7.50
Malleable scrap	7.50 to 8.00

Per Gross Ton.

Bundled sheet scrap	7.00 to 7.50
Old iron rails	12.50 to 13.00
Relaying rails, 50 lb. and up	20.00 to 21.00
Rerolling steel rails	11.00 to 11.50
Melting steel rails	9.00 to 9.50
Heavy melting steel scrap	9.00 to 9.50
Old car wheels	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., January 29, 1912.

Pig Iron.—Confirmation has just been made of the sale of 36,000 tons of foundry iron to a pipe manufacturing interest, and reports are current that 10,000 tons additional was sold to similar interests during the week, all for delivery in the first half, and understood to have been placed at $10.25, $9.75, and $9.25, Birmingham, for Nos. 2, 3 and 4 foundry respectively. This tonnage is over and above that mentioned in last report as having been involved in transactions covering storage warrants. As a result of an accident at a local furnace plant, an additional stack was blown out the past week, reducing the number of active stacks on foundry iron to 13. This last reduction will be offset by the blowing in of one stack as soon as some repairs have been completed, which may take three to five weeks. An advance of 25c. on spot shipments and deliveries in the first half has just been made by a large producer, thereby leaving the probable available tonnage at $10 in the hands of two makers. One of these quoting $10 offers spot shipment only, owing to the proposed suspension of all operations at an early date. Such conditions as just mentioned have had a decided tendency to clear up the market situation, and all sellers are more optimistic than for some weeks. The recent demand for

small lots has aggregated a fairly attractive volume, and shipments against all contracts have held up remarkably well. In the week a sale of 500 tons of No. 2 soft for first quarter shipment was made at $10.25; 300 tons of No. 3 foundry at $9.75, and 350 tons of forge at $9.25. This last can hardly be considered fairly representative, owing to the nature of the demand for the particular lot sold, but No. 4 foundry, as well as forge and mottled, is very scarce. A small lot of off basic was sold at $9.75, and small quantities of charcoal iron sold at $22.50, Birmingham. Quotations on first half deliveries are generally made at an advance of 25c. to 50c. over the figures named below, but there is some tonnage to be had for shipment over the entire first half at the figures referred to, and we quote accordingly per gross ton, f. o. b. cars at Birmingham district furnaces:

No. 1 foundry and No. 1 soft	$10.50
No. 2 foundry and No. 2 soft	10.00
No. 3 foundry	9.50
No. 4 foundry	9.25
Gray forge	9.00
Standard basic	10.00
Off basic	9.50

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company will furnish 2500 to 3000 tons of water pipe for requirement at Macon, Ga., and it is understood that the St. Paul, Minn., requirement of some 5000 tons will be furnished by Virginia manufacturers. Specifications for 1400 tons of water pipe for Spokane, Wash., are under consideration. Atlanta, Ga., is to enter the market for 2000 tons January 30, and the gas requirement at Albany, Ga., is still under consideration. The call against contracts is very heavy, and local plants are operating to capacity. So far as can be ascertained, prices are being fully maintained, and we continue to quote as follows, per net ton, f. o. b. cars here, for water pipe, with $1 per ton extra for gas pipe: 4 to 6-in., $23; 8 to 12-in., $22; over 12-in., average $21. Special fittings are quotable at $50 to $55 per net ton at Birmingham foundries.

Old Material.—All parties concerned are apparently interested in bargain lots only, and, as a result, the movement is very spasmodic. Transactions reported the past week involved lots of 50 to 150 tons each at prices about in line with those given below, although they are considered nominal and subject to change in accordance with local conditions. We continue to quote asking prices as follows, per gross ton, f. o. b. cars here:

Old iron axles (light)	$12.00 to $12.50
Old steel axles (light)	11 00 to 11.50
Old iron rails	11.00 to 11.50
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	6.00 to 6.50
No. 2 country wrought	5.50 to 6.00
No. 1 machinery	8.50 to 9.00
No. 1 steel	8.00 to 8.50
Tram car wheels	7.50 to 8.00
Standard car wheels	9.50 to 10.00
Light cast and stove plate	6.00 to 6.50

No. 1 furnace at the City plant of the Sloss-Sheffield Steel & Iron Company was blown out the past week by reason of an accident that destroyed a part of the lining. It is estimated that some five months will be necessary to make the repairs required. No. 2 furnace at the same plant will be blown in as soon as repairs now under way are completed, which will be prior to March 1.

St. Louis

ST. LOUIS, MO., January 29, 1912.

The market at this point is largely in a waiting state, with no disposition by buyers to increase their contracts and none by sellers to make any concessions for new business, this latter largely because capacity is pretty well booked for some weeks to come. The situation has brought about no softening of quotations, but rather the contrary is true. Reports as to collections throughout the St. Louis territory are that they are very generally good in the iron and steel business.

Pig Iron.—Quotations on pig iron have stiffened materially, though there have been no increases except in the few brands that have heretofore lagged behind the leaders in the advance. The price generally, now, is $10, Birmingham, for No. 2 Southern, and $13 to $13.50, Ironton, for No. 2 Northern. The sales of the week were chiefly in small, odd lots, with the exception of one of 200 tons special analysis. An inquiry in the market for 400 tons of No. 2 Southern constitutes about all there is except the carload business. That the melt is good, however, is shown by the movement of tonnage, which is greater than contracts require, and all new business is on the quick shipment basis.

Coke.—Foundry coke has stiffened in tone materially, and $2.25, at oven, is the best figure here for Stonega or Connellsville, best 72-hr. selected. Orders have been chiefly for small lots for immediate shipment. Contract shipments are keeping up well and the total tonnage movement is good, in consonance with the pig iron movement. By-product coke is selling at $5.20, delivered.

Finished Iron and Steel.—There is a steady movement on contract, but very little new business is coming into the market at present. The chief and almost the only order of moment during the week was one of 700 tons placed by the Cotton Belt Railroad with the Wisconsin Bridge Company. Orders for structural material are mostly for specific work, and in practically every instance quick shipment is demanded. Bars have been in fair demand. Plates have moved in small tonnage. In standard rails two inquires came in during the week, one for 500 tons for a Southwestern road and another for 2000 tons for a Western road, but neither has yet been placed. Track fastenings have been in fair demand at 1.45c., Chicago. Light rails are not moving as they should, neither the coal interests nor the lumber roads taking anything like the tonnage usual at this season.

Old Material.—The scrap market shows no really new features. Buyers and sellers are still watching each other, and the lists closed last week went at prices which show no material decrease. Information at hand indicates an increasing demand soon. A number of works using this material, such as the Granite City plant of the National Enameling & Stamping Company and the Helmbacher Forge Company, are starting up or preparing to do so. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton.

Old iron rails	$14.00 to $14.50
Old steel rails, re-rolling	11.50 to 12.00
Old steel rails, less than 3 ft	11.00 to 11.50
Relaying rails, standard section, subject to inspection	21.50 to 22.00
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards cut apart	11.00 to 11.50

Per Net Ton.

Iron fish plates	$12.50 to $13.00
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	9.75 to 10.25
Locomotive tires, smooth	13.00 to 13.50
No. 1 dealers' forge	8.00 to 8.50
Mixed borings	6.00 to 6.50
No. 1 busheling	9.00 to 9.50
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	7.50 to 8.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

San Francisco

SAN FRANCISCO, CAL., January 23, 1912.

A general renewal of activity, extending to nearly all lines of steel products and covering the entire coast, has been noted since the middle of the month. The tonnage is not unusually large even for this season, but the resumption of buying thus early encourages the anticipation of at least a normal year. Jobbers find it necessary to replenish their stocks on a quite large scale and note a marked improvement in the distributive trade. The revival, however, has brought out no tendency toward speculation, as continued activity is not yet fully assured, and the possibility of tariff changes causes some uneasiness. Local competitive conditions are also unfavorable, causing unprofitable price reductions in several lines. Most local merchants are disposed to take advantage of the stock carried by the United States Steel Products Company, which enables them to carry smaller stocks in their own warehouses than in the past. The policy of this interest has already been effective in curtailing the tonnage of foreign material ordered for shipment to this market and if the present tariff is maintained importations will be closely limited.

Bars.—The demand for soft steel bars is improving, particularly in the small trade, and merchants' specifications are coming out in good shape. A number of good orders have also been booked for reinforcing material, though sales are mostly in small lots. Several mills on the coast are now placing reinforcing bars on the market and are capable of handling a much larger tonnage than formerly. Prices are accordingly somewhat unsettled, the ruling quotations at present

being about 1.90c. for open-hearth bars and 1.85c. for bars rerolled from old rails. A sharp cut has been made in the jobbing price of merchant bars, which have been quoted at 2c. for several months. The present prices from store, San Francisco, are 1.85c. for steel and 1.75c. for iron.

Structural Material.—The general situation remains quiet, no important contracts being reported outside of San Francisco, though a fair tonnage has been placed locally. The principal contract is for the Sharon estate building on New Montgomery street, about 750 tons, taken by the American Bridge Company. The Pacific Rolling Mill Company has taken the Fleishhacker building, about 300 tons, and the McClintic-Marshall Construction Company has 150 tons for a smelter at Tacoma, Wash. The Mortenson Construction Company has a small job on the Morton building at Third and Howard streets. The Healy-Tibbitts Construction Company has the general contract for pier 17, which will require about 300 tons. Plans are under way for large additions to the State ferry building and other important harbor work. An award is expected on the Garland Theatre at Los Angeles this week. Local projects to be figured shortly are the Bryan building and the Schlesinger building, requiring altogether about 500 tons. The Sharon estate company has plans under way for several other structures and plans are complete for the Geary street power house, which will require about 500 tons. Several transactions are now pending and a large tonnage is likely to be placed within the next two weeks.

Rails.—While several moderate-sized orders have been booked recently, standard sections are now a little quiet, the principal inquiry being for grooved rails for street railroads. Practically all the coast interurban lines are taking an interest in the market, placing small orders from time to time for immediate delivery. An unusually large tonnage is expected in the spring and summer from the smaller interests, though some business now in prospect may be delayed in anticipation of a reduction in the tariff.

Sheets.—Consuming industries are in good shape and some manufacturers of sheet steel products are preparing to increase their facilities. Local sales agents report a gratifying increase in current orders, both from manufacturers and merchants, and the distributive trade shows more activity than for over a month past.

Plates.—The jobbing trade shows some slight improvement, though few important inquiries have been received for tank steel. The current requirements of several coast shipbuilding firms are a little above the average of recent years, but the tonnage used for this purpose is not a very important factor.

Merchant Pipe.—Merchants, though still very conservative, are buying more freely than for many months, and if the trade requirements of the first quarter are up to expectations a considerably heavier movement is anticipated for the following months. The distributive movement has started in good shape, with prospects of continued improvement. Stocks carried over from last year by both merchants and consumers were extremely light. Several small inquiries have come out from waterworks projects, but the oil field business is quiet. The oil situation, however, is more favorable.

Cast Iron Pipe.—Business in hand shows little increase, but inquiries are coming out in better shape. The Playground Commission of San Diego, Cal., has placed an order for 175 tons with Hazard, Gould & Co., and the San Diego Consolidated Gas & Electric Company has started work on a large extension. The city of Los Angeles opens bids January 30 on 1426 tons of 4, 6 and 12-in. pipe, and the Los Angeles Gas & Electric Company will let a contract January 26 for about 1200 tons. Orders are expected shortly from numerous gas and water companies.

Pig Iron.—While the foundry trade in some quarters shows a slight improvement, the pig iron sales have not increased appreciably. Purchases of Southern iron are larger than usual, but the principal business is on foreign material. Coast steel plants are expected to become a rather important factor in the market, but so far their requirements have been very moderate. Prices are quoted as follows: Chinese foundry iron, $23; English and Continental, ordinary brands, $22; No. 2 Southern foundry iron, $20.

Old Material.—The only notable development is the shipment of 1000 tons of steel scrap for Italy this week. Buyers along the coast, however, are taking more interest in the market, and several good-sized deals in steel melting scrap are in prospect. Deliveries of rerolling rails are still being made on old contracts. Wrought scrap is quiet, but steady in value, while cast iron scrap receives very little attention. Prices are quoted as follows: Cast iron scrap, per net ton, $14; steel melting scrap, per gross ton, $11.50; wrought scrap, per net ton, $12.50 to $15; rerolling rails, per net ton, $11.

Buffalo

BUFFALO, N. Y., January 29, 1912.

Pig Iron.—The market is quiet and only a small amount of new business has developed during the week. Inquiry is light, the requirements of most melters being fully covered for the first quarter and to some extent for the second quarter. Furnaces are apparently not actively in quest of business, most of them being completely sold up for the first quarter and largely sold for the second quarter. Although new business is of small volume, furnaces are "snowed under" with specifications on contracts. The week has also shown an urgent demand for rush shipments of coke, due undoubtedly to the close margin of time for delivery allowed by purchasers and delays in transit on account of low temperature weather conditions rather than to increased consumption. Everything considered, prices are quite firm at the existing schedule, which is as follows for first half delivery, f.o.b., Buffalo:

No. 1 X foundry	$13.75	to	$14.25
No. 2 X foundry	13.75	to	14.00
No. 2 plain	13.50	to	13.75
No. 3 foundry			13.50
Gray forge	13.25	to	13.50
Malleable	13.75	to	14.25
Basic	14.00	to	14.50
Charcoal	15.75	to	17.25

Finished Iron and Steel.—The amount of new business placed for the week has been of moderate volume, and specifications on contracts for bars, plates and shapes have not been as large as for the preceding week, but prices are well maintained. Most agencies report that orders placed on books for January including new business and specifications on contracts will likely be about equal in volume to the total for December. One agency states that business for wrought pipe has been running larger for January than for the preceding month. An order is pending for a considerable tonnage of reinforcing bars for concrete construction in the new factory building to be erected by the Spirella Corset Company at Niagara Falls. The Lackawanna Steel Company has booked large additional orders for steel rails and has also booked a heavy tonnage of bar material and plates. It has one bar mill running double time. In fabricated structural material no awards of any importance have come out, but a good amount of work is in sight for the near future. Plans are being finished by Green & Wicks, architects, Buffalo, for the Auditorium building of the Cornell University, Ithaca, requiring a considerable tonnage of steel, bids for which will soon be received. The Lackawanna Bridge Company has a large amount of work in hand, including a small tonnage of steel for the new factory of the Central Casket Company, Buffalo, for which the order was placed this week.

Old Material.—The only important change in conditions is a little stronger tendency and a greater movement in heavy melting steel, specifications on contracts coming in somewhat more freely. Shipments are still hampered by adverse weather conditions. Dealers are not anxious to take on new business of large tonnage, feeling that the market will soon be stronger and prices on a higher level. Prices are unchanged from last week, as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.50	to	$12.75
Low phosphorus steel	15.75	to	16.00
No. 1 railroad wrought	14.00	to	14.50
No. 1 railroad and machinery cast scrap	13.50	to	14.25
Old steel axles	18.50	to	19.25
Old iron axles	22.00	to	22.50
Old car wheels	12.75	to	13.00
Railroad malleable	12.75	to	13.00
Boiler plate, sheared	13.75	to	14.25
Locomotive grate bars	11.00	to	11.25
Pipe and tank	9.75	to	10.25
Wrought iron and soft steel turnings	7.25	to	7.50
Clean cast borings	6.75	to	7.00

Bids for the removal of the steel piling used for the cofferdam construction around the United States ship canal lock in Black Rock harbor, Buffalo, about 7000 tons, will be opened February 15 in the office of Lt.-Col. J. G. Warren, U. S. engineer, Federal Building, Buffalo. This piling was driven about three years ago and was manufactured by the Lackawanna Steel Company, being the same kind of piling used around the battleship Maine at Havana.

The German Iron Market

This Year Promises to Be One of the Best That Germany Has Ever Had

BERLIN, January 18, 1912.

The upward movement of iron and steel prices continues unabated and appears to be growing even more general. At the end of last week news came from the Silesian district that bars and heavy and light plates had been advanced 2.50 to 5 marks per ton, and this week it is reported from the Siegerland district that thin plates have been marked up there to 140 to 145 marks in consequence of the unusually heavy demand. The Siegen dispatch said that even higher prices are obtained for highest qualities, or where prompt delivery is stipulated; and it is added that export prices have also further risen. Another dispatch of yesterday from Dortmund also mentions a further advance on bars within the past few days; large home orders have been placed at 113 to 115 marks for basic steel, while export prices have risen to 108 to 110 marks. The same dispatch states, however, that sales of bars have grown somewhat lighter owing to the fact that unusually large orders were placed in the first two weeks of the month.

The firmness of the Belgian market also continues. At the end of last week basic steel plates and band iron rose 5 francs to 160 to 165 francs for the former and 167.50 to 172.50 francs for the latter for home delivery. A dispatch of yesterday reports that basic steel bars have gone up to 140 to 145 francs, iron bars to 145 to 147.50 francs, bands to 167.50 to 175 francs, and light beams to 140 francs.

The general market situation has further improved. Nearly all establishments have orders on their books that will keep them occupied till the middle of the year; and in some products not controlled by trade organizations orders extend even longer. Crude steel is growing visibly scarcer, the mills being occupied in nearly all cases in filling their regular orders and being thus unable to take supplementary orders or to sell to outsiders. As matters look now the year promises to be one of the very best that the German iron trade has ever had. Prices, indeed, are not as high as they were in some previous boom periods; but the works have increased their facilities for cheap production to such a degree that they can make very satisfactory profits even at present prices.

In the ore market prices are firm, but buyers are disposed to resist them as too high. Hence in foreign ores considerable recent buying has been for shorter periods than usual. Orders for home ores have mostly been made at somewhat higher prices. This was the case with minettes in the Luxemburg-Lorraine district and furnacemen are also disposed to reject Nassau 50 per cent. brown iron ores at 14.50 marks. In the Siegerland district the mine-owners' organization has just abolished the restriction on production in view of the commencement of shipments to upper Silesia. Shipments from that region were already in December considerably in excess of production.

According to the latest information from the western districts the demand for pig iron from both the home and the foreign markets is very heavy and calls for shipments of iron on order are coming in with a rush. An extraordinary demand for scrap is mentioned and the large supply coming regularly upon the market is readily absorbed.

The Steel Works Union held its usual monthly meeting to-day and gave out its survey of the situation in half-rolled steel material, rails and structural shapes. It says that the mills are well employed on half-rolled steel, that calls for delivery are quite brisk and that shipments for the rest of the business year (June 30) can be expected to maintain the level of the past months. The foreign market also continues favorable. A larger demand for light rails is in prospect for the spring trade and there is a big business doing in grooved rails, particularly for export. An active business in rails for mining purposes is doing at better prices. The demand for structural shapes has been checked by the cold weather that set in about two weeks ago, but the foreign market continues to buy on a large scale, England particularly showing an extraordinary demand. A satisfactory business in structural shapes is also being done with Scandinavian countries, Holland, Switzerland and the lower Danubian countries.

In other sections of the trade not covered by the above report business continues very active. The demand for bar steel has further increased and some mills are unable to take further orders for delivery in the first half-year. Consumers are willing to pay high prices on quick-delivery orders, 117.50 marks being mentioned as maximum. Best-rolled open-hearth bars command as much as 120 marks. Mills running on iron bars continue to work at their full capacity and prices have risen. Bands are being turned out on a large scale in response to a heavy demand. Cold-rolled bands are being called for delivery at a brisker pace. Mills turning out strips are working at their utmost capacity, the demand for steel tubing having latterly increased.

The heavy plate manufacturers continue to be unable to fill all their orders and are only taking a part of the new business offering. Business in ship plates remains extraordinarily heavy. The trade combination controlling this specialty took in December twice as much on order as in November and the pressure for plates has continued this month on an equal scale. The previous activity in medium and thin plates is fully maintained. Tin and terne plates are in active demand, with prices tending upward. Orders for tin plates are on hand for a long period. The volume of business in rods has further increased, owing to the improved demand for wire and higher prices are being demanded for both classes. Increased foreign orders have come in at better prices than previously prevailed. It is announced that the great Thyssen works, Gewerkschaft Deutscher Kaiser, has recently bought an unsuccessful wire and wire-nail mill at Dinslaken and will make it a department of its general concern.

The Steel Works Union took no action whatever to-day regarding its prolongation. A telegram from Düsseldorf says that the negotiations are regarded as broken off till certain mills have withdrawn their demands for increased allotments. Apparently the outlook for the prolongation has grown worse within a week.

The production of iron ores in the Briey district of France last year rose to 10,427,000 tons, which denotes a gain of 1,957,000 tons over 1910. The gain for 1910 over 1909 was 2,160,000 tons.

Boston

BOSTON, MASS., January 30, 1912

Old Material.—The demand for scrap has fallen and prices have dropped to the level of a fortnight ago. As the dealers analyze the situation the recent low market stimulated buying to such an extent that prices were advanced, but the demand has not yet become permanently strong. Heavy melting steel, No. 1 wrought, wrought iron pipe and cotton ties share in the drop. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices.

Heavy melting steel	$9.00 to	$9.50
Low phosphorus steel	11.45 to	11.95
Old steel axles	14.00 to	14.50
Old iron axles	17.00 to	18.00
Mixed shafting	13.00 to	14.00
No. 1 wrought and soft steel	10.50 to	11.00
Skeleton (bundled)	7.00 to	7.50
Wrought iron pipe	8.50 to	9.00
Cotton ties	7.00 to	7.50
No. 2 light	4.50 to	5.00
Wrought turnings	6.00 to	6.50
Cast borings	5.25 to	5.75
Machinery, cast	12.50 to	13.00
Malleable	9.25 to	9.75
Grate bars	6.00 to	6.50
Stove plate	8.00 to	8.50
Cast iron car wheels	11.75 to	12.00

A short time ago the Pennsylvania Railroad announced that it would pay its men for valuable ideas. The first results of the experiments have just been made public. As was expected, the men in charge of minute detail saw ways of increasing efficiency which escaped the general directors of the work. Suggestions came in from all quarters. Many of them proved to be of real value and their authors were rewarded in cash. Although a great many worthless suggestions come in, officials say that the saving effected by those which are adopted makes it very much worth while to investigate them all. Aside from these direct benefits, there is much indirect gain in the added interest employees take in their work and in the watchfulness and originality thus developed.

New York

NEW YORK, January 31, 1912.

Pig Iron.—Very few transactions have been reported in the local market in the past week. The principal buying has been in Connecticut, where one consumer has taken a round lot of foundry iron. Recent pipe foundry inquiry in the East has now been satisfied. Further reports of low prices come from eastern Pennsylvania on foundry grades and there has been some activity in basic, apparently on a basis slightly below $14.25, delivered. Southern basic has been competing with the Pennsylvania product at certain points, but the firmer position of Southern sellers tends to give the present limited market for basic iron to Northern producers. We quote as follows for Northern iron at tidewater: No. 1 foundry, $15; No. 2 X, $14.75; No. 2 plain, $14.50 to $14.75c. We quote Southern iron at $15 for No. 1 foundry and $14.50 to $14.75 for No. 2.

Finished Iron and Steel.—Prices as low as they have been in recent weeks and few new offerings of size describe present conditions in fabricated steel work. The activity since the last report has involved the closing of some large structural contracts placed chiefly by the railroads. The settlement of the considerable volume of finished material from this source without an equal new demand appearing tends to create a condition of weakness which happily seems to be local in the Eastern part of the country. Fabricating shops are still actively searching for business which will more nearly bring them to a high percentage of capacity for a number of months. The general run of small lots continues up to the level of recent weeks and this steadying factor and the stability of prices for plain material works to counteract the situation in the field of large structures. Steel bars are still held at 1.15c., Pittsburgh basis, and the larger steel makers are holding for 1.20c., Pittsburgh, for plates and shapes. Orders for bar iron are reported in better volume than was the case a week ago, with improvement in price. Among the structural awards the American Bridge Company took 13,000 tons in three contracts, one of these, 6500 tons of structural material for the Southern New England Railroad, regarded as a part of the Grand Trunk system, and another 5000 tons for bridge requirements of the Delaware & Hudson, leaving 1500 tons for a building to be erected at Broadway and Forty-second street. The remaining large railroad award, 3800 tons, for the Billerica shops of the Boston & Maine, went to the McClintic-Marshall Construction Company. The Phoenix Iron Company is to supply 250 tons of steel work for the Pennsylvania Institute for the Feeble Minded at Spring City, Pa., and the Virginia Bridge & Iron Company is to supply 1100 tons for the Holston National Bank, Knoxville, Tenn., and 400 tons for the Hamilton County court house, Chattanooga. The New York Central took bids on January 30 for 700 tons additional structural work for the Grand Central terminal and will receive tenders on February 5 for 1000 tons more; it has also asked for bids on 200 tons of power transmission poles. Among other work counted on for the early future are 2500 tons for a power house at Mauch Chunk, Pa., for the Lehigh Coal & Navigation Company; 2000 tons for the Manufacturers' Club, Philadelphia; about 2000 tons for the Bellevue-Stratford Hotel, Philadelphia; 2500 tons for two pavilions at Bellevue Hospital, and a monumental court house in Brooklyn. Quotations are: Steel bars, plates and plain structural material, 1.31c. to 1.36c.; bar iron, 1.27c. to 1.32c., all New York. Plain material from store, New York, 1.70c. to 1.80c.

Cast Iron Pipe.—Brockton, Mass., opens bids February 2 for 125 tons; Bridgeton, N. J., February 6, 110 tons; Department of Water Supply, Gas and Electricity, New York City, February 9, 4100 tons, principally 30-in., and 1550 tons, principally 8-in., both for the Borough of Queens; Pawtucket, R. I., February 14, 1200 tons; Manhasset, Long Island, February 15, 2200 tons of 4, 6, 8 and 10-in. No details are yet available regarding the pipe which may be needed for an extension of the New York City high pressure fire service. So far only rumors are in circulation. A moderate demand is being received from private buyers. Carload lots of 6-in. are quoted at $22 to $23 per net ton, tidewater.

Old Material.—Not only is the demand quiet but large consumers are requesting all shipments to be held up. A most discouraging feature of the immediate situation is that many important buyers will not take old material at any price. This is quite unusual, as consumers are generally disposed to take advantage of bargain offerings. Dealers report practically no demand for relaying rails. Prices are off 25 to 50c. on almost the entire list. Dealers quote, per gross ton, New York and vicinity, as follows:

Old girder and T-rails for melting	$9.25	to	$9.75
Heavy melting steel scrap	9.25	to	9.75
Relaying rails	20.00	to	20.50
Rerolling rails (nominal)	11.50	to	12.00
Standard hammered iron car axles	19.00	to	19.50
Old steel car axles	14.25	to	14.75
No 1 railroad wrought	11.75	to	12.25
Wrought iron track scrap	11.00	to	11.50
No. 1 yard wrought, long	10.00	to	10.50
No. 1 yard wrought, short	9.25	to	9.75
Light iron	4.00	to	4.50
Cast borings	6.00	to	6.25
Wrought turnings	6.50	to	6.75
Wrought pipe	9.25	to	9.50
Old car wheels (nominal)	12.00	to	12.50
No. 1 heavy cast, broken up	11.00	to	11.50
Stove plate	8.75	to	9.00
Locomotive grate bars	9.00	to	9.50
Malleable cast	9.00	to	9.50

Ferroalloys.—The market for ferroalloys in New York has been quiet. All of the business has been in comparatively small lots at prices which were firm at $41 for 80 per cent. ferromanganese and $70 for 50 per cent. ferrosilicon. No early recessions from these prices are looked for.

Metal Market

NEW YORK, January 31, 1912.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
Jan.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
25	14.50	14.25	43.50	4.45	4.35	6.55	6.40
26	14.50	14.25	43.25	4.45	4.35	6.55	6.40
27	14.50	14.25	.....	4.45	4.35	6.55	6.40
29	14.50	14.25	43.75	4.45	4.35	6.55	6.40
30	14.50	14.25	43.65	4.25	4.17½	6.55	6.40
31	14.50	14.25	43.75	4.25	4.17½	6.55	6.40

Producers of copper continue to hold their prices at over 14c. despite an inactive market. Second hands have quoted lower prices for copper, some of which are said to have gone below 14c. There has been a little buying of tin at good prices which were of usual irregularity. Lead is 20 points lower. Spelter is steady and in fair demand in the Middle West. Cookson's antimony is ⅛c. lower.

New York

Copper.—With very little trading in copper, the producers have continued to hold their prices of from 14.25c. to 14.50c. for electrolytic. Lake is quoted about 14.50c. Fluctuations in the London market have been the indirect cause during the week of a rather unsettled feeling here. Resale copper has been offered at figures considerably under those of the producers, one report having it that sales of electrolytic were made on Monday last at 13.87½c. The producers appear to be holding out for April business and not much activity is looked for until after the issuance of their statement on February 8. On the other hand consumers still await a decline before entering the market. Spot copper is quoted in London to-day at £62 7s. 6d. and futures at £63 2s. 6d. The exports of copper this month, not including the last two days of the month, have been 30,642 tons.

Pig Tin.—Business in pig tin in the last week has been light, both consumers and dealers letting the market alone to a great extent. London prices for spot have varied from £192 to £194 15s. with corresponding variations in prices here. A little more activity prevailed on Monday last, both dealers and consumers buying a little more freely, but the movement was not extensive. Spot tin is quoted in London to-day at £194 15s. and futures at £192 5s. The arrivals of tin this month have been 3130 tons and there is reported afloat 1290 tons. In New York 43.75c. is quoted to-day.

Tin Plates.—The local situation in tin plates remains unchanged. No new demands have developed. The only feature is the reduction in the price of tin plates laid down at Swansea, Wales, to 13s. 6d., a decline of 1½d. The price of 100-lb. coke plates in New York is unchanged at $3.64.

Lead.—The American Smelting & Refining Company on January 30 announced a reduction of 20 points in the price of lead. The New York price now stands at 4.25c. and that of St. Louis at 4.17½c. The principal reason for the reduction is supposed to be the lack of demand, lead having been dull for some time.

Spelter.—A good demand for spelter is coming from galvanizers in the Middle West. The scarcity of some brands continues and in the case of others consumption is fully up to production. The New York price is firm at 6.55c. and 6.40c. is quoted at St. Louis.

Antimony.—The feature in antimony is a further reduction of ⅛c. in Cookson's, which is now quoted at 7.25c. Hallett's is unchanged at about 7.55c. and Chinese and Hungarian grades at 6.90c.

Old Metals.—The market is dull. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	13.25 to 13.50
Copper, heavy and wire	13.00 to 13.25
Copper, light and bottoms	11.75 to 12.00
Brass, heavy	9.25 to 9.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.50 to 8.75
Composition turnings	9.50 to 10.00
Lead, heavy	4.25
Lead, tea	4.00
Zinc, scrap	5.25

Chicago

JANUARY 30.—The quietness of the local metal market for the past fortnight has developed into more apparent weakness, due in a large measure, so far as copper is concerned, to the liquidation of stocks in second hands. We have revised our quotations at Chicago as follows: Casting copper, 14.37½c.; Lake, 14.62½c., in carloads for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 44.50c.; small lots, 45.50c.; lead, desilverized, 4.40c. to 4.45c., for 50-ton lots; corroding, 4.55c. to 4.60c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.50c. to 6.60c.; Cookson's antimony, 8.75c., and other grades, 7.75c. to 8.25c., in small lots; sheet zinc is $8, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount, in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 11.75c.; copper bottoms, 10.75c.; copper clips, 11.50c.; red brass, 10.75c.; yellow brass, 8.50c.; lead pipe, 3.90c.; zinc, 4.25c.; pewter, No. 1, 26c.; tinfoil, 37c.; block tin pipe, 38c.

St. Louis

JANUARY 29.—The demand for metals, generally, has been fair and good quantities are moving. Tin is slightly higher, being quotable at 43.85c. Lake copper is lower at 14.37½c. Electrolytic is off to 14.27½c. Antimony is also lower, being quoted at 7.72½c. Lead is about the same at 4.37½c. Spelter is quiet at 6.40c. to 6.50c., having had a drop during the week, part of which it has recovered. In the Joplin ore district zinc blende brought $50 per ton on an assay basis of $47 for lots carrying 60 per cent. metal. The basic price ranged as low as $44 per ton, the general offerings being about $1 per ton lower than those of the week before, although the top figures were as high. Calamine brought $24 to $27 per ton on an assay basis of 40 per cent. metal, with the choice lots bringing as high as $30. Lead ore was weaker at $56 to $59 per ton. Miscellaneous scrap we quote as follows: Light brass, 4.50c.; heavy brass and light copper, 8.50c.; heavy copper and copper wire, 9.50c.; zinc, 3.50c.; lead, 3.50c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, January 31, 1912.

The stock market has been under more or less depressing influences since last report, and most prices show a dip to lower level. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com	1¼	Pressed Steel, com	32⅛-32¾
Allis-Chalm., pref	7⅞-8	Pressed Steel, pref	101
Baldwin Loco., pref.	103¼-103¾	Railway Spring, com	30
Beth. Steel, com	31-32	Republic, com	23⅝-25½
Beth. Steel, pref	60¼-61	Republic, pref	81-84½
Can, com	11⅞-12⅝	Sloss, com	41-41⅛
Can, pref	91½-93¾	Pipe, com	16
Car & Fdry., com	50½-52⅝	Pipe, pref	50-51
Car & Fdry., pref	115¾-116	U. S. Steel, com	62¾-66½
Steel Foundries	29-31	U. S. Steel, pref	110½-111½
Colorado Fuel	26-26½	Westinghouse Elec	69½-74¼
General Electric	158-160⅜	Va. I. C. & Coke	65-70
Gr. N. Ore Cert	37¾-41½	Am. Ship, com	50
Int. Harv., com	106½-108¾	Am. Ship, pref	103
Int. Harv., pref	116½-120	Chic. Pneu. Tool	49¾-50½
Int. Pump, pref	81-82	Cambria Steel	43¼-44⅛
Lackawanna Steel	30-30¼	Lake Sup. Corp.	27¾-28½
Locomotive, com	33½-35	Pa. Steel, pref.	100¾-101
Locomotive, pref.	103⅛-103¾	Warwick	11-11¾
Nat. Enam. & St., com	14⅛	Crucible Steel, com.	11¾-12¼
Nat. Enam. & St., pref.	94½	Crucible Steel, pref.	81-83¼
Pittsburgh St., pref.	102¾-103	Harb. Walk Ref., pref.	100

Dividends Declared

United States Steel Corporation, regular quarterly, 1¾ per cent. on the preferred, payable February 28, and 1¼ per cent. on the common, payable March 30.

Customs Decisions

Machine Parts

In overruling a protest filed by Leon Hirsch, the Board of United States General Appraisers holds that a machine or mechanism which is for all practical purposes a unit, though made of separable parts, which parts are shipped in separated condition, must be treated for duty purposes as an entirety. It is held that the parts necessary to form, when assembled, a number of complete watch movements, imported on the same vessel and covered by the same invoice, though packed separately, are for customs purposes entireties and classifiable as "watch movements," under the act of 1909, rather than as "parts of watches."

Woodworking Machines Are Machine Tools

In sustaining a protest filed by the Georgia Pulp & Paper Company, the board decides that the term "machine tool," as used in the tariff act of 1909, is not restricted to machines used exclusively in the working of metals. The board holds that the provision may be applied as well as woodworking appliances. The machines in controversy are used in cutting or stripping the bark from pulp wood. Duty was assessed at the rate of 45 per cent. ad valorem under the provision for "manufactures of metal," whereas the importers claimed 30 per cent. as being "machine tools."

The Government claimed before the board that it established by the record that the term "machine tool" is used in trade to refer only to such machines as are used in the working of metal. Judge Fischer disagrees with this view, and finds that there is no such definite, uniform and general understanding of the term as would bring it within that commercial designation. He says:

> Altogether it is a question that affords more than doubt that if you turn iron in a lathe it is a machine tool, but if you turn wood it must belong to another class. The question may be better stated when we say that it does not appeal to us that if a lathe for metal-working is purchased a machine tool is bought, and sold, while if you buy a wood-working lathe, then the particular name of the machine (lathe) is what the trade understands as the object of purchase and sale. A machine tool is a term which in common use would without question embrace a power cutting machine used in woodworking. We hold the merchandise to be machine tools.

It has also been decided by the board that woodworking machines known as mortisers are to be regarded for tariff purposes as "machine tools." The customs officials have thus classified the machines, which are described as "radial-compensating chain mortisers," and are used as a power tool for mortising in sash, door and blind factories. The duty is reduced from 45 per cent. as a manufacture of metal, under the act of 1909, to 30 per cent. as machine tools.

Interesting Locomotive Boiler Tests

The Jacobs-Shupert U. S. Firebox Company, Coatesville, Pa., has arranged for a series of tests to be conducted under the direction of Dr. W. F. M. Goss regarding the efficiency as well as the strength and resistance of the Jacobs-Shupert sectional firebox in comparison with a similar firebox of the standard staybolt type. The tests are to be conducted at Coatesville, and a special testing plant has been erected for the purpose. On the conclusion of the efficiency tests the boilers are to be removed to a point about one-half mile distant and prepared for low water tests. Provision will be made for spectators to observe these tests without danger or injury in case of explosion. The boilers are to be identical in construction except for the fireboxes. The tests begin February 1, while the low-water test will begin on or about April 1. The works of the Firebox Company are adjacent to the steel mills of the Lukens Iron & Steel Company. Dr. Goss is dean of the College of Engineering, University of Illinois.

Steel Corporation Pensions in 1911

A Net Addition of 454 Names to the List

Posters put up at the various plants of the United States Steel Corporation subsidiaries give details of the administration of the United States Steel and Carnegie Pension Fund in 1911. Of the 1152 pension cases active on January 1, 1911, 623 were assumed from the Carnegie Relief Fund and 529 from the Pension Department of the American Steel & Wire Company. In the year the pension committee granted pensions in 565 new cases. There were 111 deaths among the pensioners in the year, so that on January 1, 1912, there were 1606 active cases on the pension list.

The 549 employees retired by the Pension Committee last year are classified as follows: Compulsory retirement, 178, or 33 per cent.; retirement at request of employee, 298, or 54 per cent.; retirement at request of employing officer, 49, or 9 per cent.; permanent incapacity, 24, or 4 per cent. In these 549 cases the average age was 66.66 years; the average service was 30.4 years, and the average pension was $20.75 per month. In three of the cases pensions were for the maximum amounts, or $100 per month, while 141, or 25 per cent. of the total number, were increased to the minimum allowance of $12 per month provided on the establishment of the joint fund in 1910. The Pension Committee refused 47 applications for pension because the facts indicated that these cases were not within the intent or spirit of the pension rules. In one case the pension granted, amounting to $12.95 a month, was declined, the employee stating that he would be unable to get along with that amount and that he would prefer to continue at work. On January 1, 1912, there were 56 cases on the active accident list. In the great majority of these cases recovery is not expected owing either to the nature of the disability or to the advanced age of the disabled employees. There were also 119 active death cases in which the death benefits are paid in monthly installments.

The distribution of the pension disbursements for 1911 by companies is as follows: American Bridge Company, $10,107.21; American Sheet & Tin Plate Company, $11,302.39; American Steel & Wire Company, $86,536.73; Newburgh & South Shore Railway Company, $557.10; Trenton Iron Company, $1837; Carnegie Steel Company, $81,505.68; Bessemer & Lake Erie Railway Company, $2120.90; H. C. Frick Coke Company, $37,592.73; Hostetter-Connellsville Coke Company, $346.80; Keystone Bridge Works, $5938.20; Oliver Iron Mining Company, $6936.22; Union Railroad Company, $189.60; Union Supply Company, $36; Duluth & Iron Range Railroad Company, $171.20; Elgin, Joliet & Eastern Railway Company, $480.14; Illinois Steel Company, $11,245.83; Lorain Steel Company, $915.41; National Tube Company, $22,721.63; Shelby Steel Tube Company, $48; Pennsylvania & Lake Erie Dock Company, $171; Tennessee Coal, Iron & Railroad Company, $697.60.

The Continental Iron & Steel Company, 2 Rector street, New York, was successful in an appeal to the Interstate Commerce Commission against the Louisville & Nashville Railroad Company for charging an excessive rate on five carloads of scrap hauled from New Orleans, La., to Richmond, Va. The scrap consisted of parts of an old bridge and the freight charge was $1100.85, at a rate of 41 cents per 100 lb. on 268,500 lb., being the rate applicable to bridge material. The railroad claimed that the material should have been broken into pieces to secure the scrap iron rate of $4.50 per net ton and cited the rule of the Southern classification to that effect. Evidence was given that the material was purchased for use as scrap and on arrival at destination was cut into pieces and remelted. The shipper, by the opinion handed down January 8, was entitled to a refund of $496.72.

The American Railway Association reports that the net surplus of the idle cars in the United States and Canada on January 17 was 90,265, which compares with 135,938 on January 3. One year previous the net surplus was 114,820. The great reduction in the two weeks ending January 17 is attributed to the cold weather, which has greatly interfered with the movement of freight.

The Production of Pig Iron in 1911

Total Production 23,649,344 Gross Tons

The American Iron and Steel Association publishes the complete statistics of the production of all kinds of pig iron in the United States in 1911. Every furnace has been heard from. Detailed statistics, reproduced from the association's Bulletin, will be found on another page of this issue.

Total Production.—The total production of all kinds of pig iron in 1911 was 23,649,344 gross tons, against 27,303,567 tons in 1910, a decrease of 3,654,223 tons, or over 13.3 per cent. Several thousand tons of ferrophosphorus, ferrotitanium, ferrovanadium, and other alloys are included for both years. The following table gives the half-yearly production since 1908:

Periods.	1908.	1909.	1910.	1911.
First half	6,918,004	11,022,346	14,978,738	11,666,996
Second half...	9,018,014	14,773,125	12,324,829	11,982,348
Total	15,936,018	25,795,471	27,303,567	23,649,344

The production in the second half of 1911 shows an increase of 315,352 tons, as compared with the production in the first half.

Classified Production.—The production of Bessemer and low-phosphorus pig iron in 1911 was 9,409,107 tons, against 11,245,642 tons in 1910, a decrease of 1,836,535 tons, or over 16.3 per cent. In the second half of 1911 the production was 4,704,683 tons, as compared with 4,704,424 tons in the first half. The production of low-phosphorus pig iron alone in 1911 amounted to 282,460 tons, against 259,077 tons in 1910.

The production of basic pig iron in 1911, not including charcoal of basic quality, was 8,520,029 tons, against 9,084,608 tons in 1910, a decrease of 564,579 tons, or over 6.2 per cent. In the second half of 1911 the production amounted to 4,584,542 tons, against 3,935,487 tons in the first half, an increase of 649,055 tons. The production in 1910 was the largest in our history; the year of next largest production was 1911.

The production of charcoal pig iron in 1911 amounted to 278,676 tons, against 396,507 tons in 1910, a decrease of 117,831 tons. A small quantity of pig iron made with charcoal and electricity is included in the figures for 1910 and 1911. In the first half of 1911 the production amounted to 161,135 tons and in the second half to 117,541 tons. No pig iron was made in 1910 or 1911 with mixed charcoal and coke.

The production of spiegeleisen and ferromanganese in 1911 was 184,717 tons, against 224,431 tons in 1910, a decrease of 39,714 tons. The production of ferromanganese alone in 1911 was 74,482 tons, against 71,376 tons in 1910. Of spiegeleisen alone the production was 110,235 tons, against 153,055 tons in 1910.

Production by Fuels.—The production of bituminous coal and coke pig iron in 1911 amounted to 23,141,093 tons, as compared with 26,257,978 tons in 1910, a decrease of 3,116,885 tons. In the first half of 1911 the production was 11,356,634 tons and in the second half it was 11,784,459 tons. The production of charcoal pig iron is given above.

The production of mixed anthracite and coke pig iron in 1911 amounted to 229,575 tons, as compared with 649,082 tons in 1910, a decrease of 419,507 tons In the first half of 1911 the production amounted to 149,227 tons and in the second half it amounted to 80,348 tons.

The production of pig iron with anthracite coal alone in 1911, included above, amounted to 17,027 tons, against 20,503 tons in 1910.

Furnaces in Blast.—The whole number of furnaces in blast December 31, 1911, was 231, against 212 June 30, 1911, and 206 December 31, 1910. The number of furnaces idle December 31, 1911, including furnaces being rebuilt, was 235, against 261 June 30, 1911, and 268 December 31, 1910.

During the last six months of 1911 the number of furnaces actually in blast for a part or the whole of the period was 275, against 297 in the first half of the year. In the last half of 1910 332 were active, against 374 in the first half.

The Pittsburgh Steamship Company has sold three of its smaller Lake boats, the Marina, Masaba and Corona. These boats will be reconstructed for special trades.

TOTAL PRODUCTION OF PIG IRON IN THE UNITED STATES IN 1910 AND 1911.

Statistics collected from the Manufacturers by The American Iron and Steel Association, all in Gross Tons of 2,240 pounds.

Production in 1911, 23,649,344 Gross Tons; in 1910, 27,303,567 Tons; in 1909, 25,795,471 Tons; and in 1908, 15,936,018 Tons.

Total Production of All Kinds of Pig Iron.

TOTAL PRODUCTION OF PIG IRON BY STATES.

States.	Blast Furnaces. In blast June 30, 1911.	Dec. 31, 1911. In.	Out.	Total.	Production—Gross tons. (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-titanium, etc.) First half of 1911.	Second half of 1911.	Total for 1911.
Massachusetts	1	1	1	2	6,424	3,225	9,649
Connecticut	0	1	2	3			
New York	15	13	16	29	833,467	729,289	1,562,756
New Jersey	1	0	8	8	39,277	1,386	40,663
Pennsylvania	81	91	73	164	4,822,832	4,984,002	9,806,834
Maryland	3	2	3	5	131,531	124,285	255,816
Virginia	7	7	18	25	159,996	133,646	293,642
Georgia	0	0	4	4	1,200	.....	1,200
Texas	0	0	4	4			
Alabama	17	22	27	49	809,795	902,648	1,712,443
West Virginia	3	3	1	4	130,455	161,017	291,472
Kentucky	3	2	6	8	46,493	48,709	95,202
Tennessee	9	8	11	19	165,722	158,926	324,648
Ohio	35	44	31	75	2,740,142	2,570,168	5,310,310
Illinois	16	14	10	24	882,807	1,225,195	2,108,002
Indiana	6	7	2	9	552,056	611,876	1,163,932
Michigan	7	8	8	16			
Wisconsin	2	4	3	7	147,477	129,330	276,807
Minnesota	1	0	1	1			
Missouri	2	1	1	2			
Colorado	3	3	3	6			
Oregon	0	0	1	1	197,322	198,646	395,968
Washington	0	0	1	1			
California	0	0	0	0			
Total	212	231	235	466	11,666,996	11,982,348	23,649,344

PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON.

New York	15	13	9	22	833,467	729,289	1,562,756
New Jersey	1	0	7	7	39,277	1,386	40,663
Pennsylvania	72	82	46	128	4,671,653	4,902,093	9,573,746
Maryland	3	2	2	4	130,901	124,285	255,186
Virginia	6	6	15	21	160,397	131,750	292,147
Georgia	0	0	2	2			
Texas	0	0	3	3			
Alabama	16	20	25	45	788,895	890,991	1,679,886
West Virginia	3	3	1	4	130,455	161,017	291,472
Kentucky	2	1	6	7	46,159	47,415	93,574
Tennessee	8	7	11	18	164,482	156,460	320,942
Ohio	34	43	30	73	2,739,517	2,568,891	5,308,408
Illinois	16	14	10	24	882,807	1,225,195	2,108,002
Indiana	6	7	2	9	542,193	624,044	1,166,237
Michigan	2	2	2	4			
Wisconsin	1	3	3	6			
Minnesota	1	0	1	1			
Missouri	1	0	1	1	226,431	221,643	448,074
Colorado	3	3	3	6			
Washington	0	0	1	1			
Total	190	206	180	386	*11,356,634	*11,784,459	*23,141,093

* Includes small quantities of ferro-alloys made with coke and electricity.

ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

New York	0	0	5	5	149,227	80,348	229,575
New Jersey	0	0	1	1			
Pennsylvania	6	6	23	29			
Total	6	6	29	35	149,227	80,348	229,575

PRODUCTION OF CHARCOAL PIG IRON BY STATES.

Massachusetts	1	1	1	2	6,424	3,225	9,649
Connecticut	0	1	2	3			
New York	0	0	2	2	1,952	1,561	3,513
Pennsylvania	3	3	4	7			
Maryland	0	0	1	1	1,429	1,896	3,325
Virginia	1	1	3	4			
Alabama	1	2	2	4	20,900	11,657	32,557
Georgia	0	0	2	2	1,574	3,760	5,334
Texas	0	0	1	1			
Kentucky	1	1	0	1			
Tennessee	1	1	0	1			
Ohio	1	1	1	2	625	1,277	1,902
Michigan	5	6	6	12	98,232	62,652	160,884
Wisconsin	1	1	0	1	29,999	31,513	61,512
Missouri	1	1	0	1			
Oregon	0	0	1	1			
California	0	0	0	0			
Total	16	19	26	45	*161,135	*117,541	*278,676

* Includes small quantities of pig iron and ferro-alloys made with charcoal and electricity.

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Bituminous	190	206	180	386	11,356,634	11,784,459	23,141,093
Anth. & anth. & coke	6	6	29	35	149,227	80,348	229,575
Charcoal	16	19	26	45	161,135	117,541	278,676
Total	212	231	235	466	11,666,996	11,982,348	23,649,344

Miscellaneous Pig Iron Statistics.

PRODUCTION OF PIG IRON IN PENNSYLVANIA AND OHIO.

	Districts.	Blast Furnaces. In blast June 30, 1911.	Dec. 31, 1911. In.	Out.	Total.	Production—Gross tons. (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-titanium, etc.) First half of 1911.	Second half of 1911.	Total for 1911.
Pennsylvania.	Lehigh Valley	13	10	15	25	423,788	463,225	887,013
	Schuylkill "	7	9	9	18	375,973	346,292	722,265
	L. Susq. "	7	6	11	17	225,170	221,501	446,671
	Juniata "	1	2	5	7	51,518	42,106	93,624
	Allegheny Co.	33	35	12	47	2,488,508	2,627,686	5,116,194
	Shenan. Valley	9	12	12	24	637,625	614,728	1,252,353
	Miscel. bitum.	8	14	5	19	618,298	666,903	1,285,201
	Charcoal	3	3	4	7	1,952	1,561	3,513
Ohio.	Mahoning Val.	16	19	5	24	1,134,795	1,258,780	2,393,575
	Hocking "	0	0	1	1	827,976	749,342	1,577,318
	Lake Counties	9	10	7	17			
	Miscel. bitum.	6	8	8	16	594,005	462,187	1,056,192
	H. R. bitum.	3	6	9	15	182,741	98,582	281,323
	H. R. charcoal	1	1	1	2	625	1,277	1,902

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

New York	240,641	209,200	449,841
Pennsylvania	1,741,542	1,719,723	3,461,265
Maryland	130,901	124,285	255,186
Virginia, West Va., Kentucky, and Tenn.	173,284	197,202	370,486
Ohio	1,707,978	1,575,796	3,283,774
Illinois, Colorado, and California	710,078	878,477	1,588,555
Total	4,704,424	4,704,683	9,409,107

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON IN PENNSYLVANIA AND OHIO BY DISTRICTS.

Pennsylvania.	Lehigh Valley	91,720	82,267	173,987
	Schuylkill Valley			
	Lower Susquehanna Valley	44,932	42,373	87,305
	Allegheny County	1,070,758	1,007,999	2,078,757
	Shenango Valley	534,132	587,084	1,121,216
	Miscellaneous bituminous			
Ohio.	Mahoning Valley	803,726	836,862	1,640,588
	Lake Counties	478,229	383,592	861,821
	Hanging Rock bituminous	426,033	355,342	781,365
	Miscellaneous bituminous			

PRODUCTION OF BASIC PIG IRON, NOT INCLUDING CHARCOAL IRON

New York and New Jersey	158,293	163,472	321,765
Pennsylvania—Allegheny County	1,335,712	1,548,215	2,883,927
" Other counties	1,128,377	1,156,467	2,284,844
Virginia	178,012	267,880	445,892
Alabama			
Ohio	518,544	593,197	1,111,741
Indiana and Illinois	481,690	742,564	1,224,254
Michigan, Missouri, and Colorado	134,859	112,747	247,606
Total	3,935,487	4,584,542	8,520,029

PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

Pennsylvania	66,577	80,234	146,811
Illinois	11,018	26,888	37,906
Total	77,595	107,122	184,717

PRODUCTION OF ALL KINDS OF PIG IRON FROM 1907 TO 1911.

States—Gross tons.	Production—(Includes spiegeleisen, ferro-manganese, etc.) 1907.	1908.	1909.	1910.	1911.
Massachusetts	19,119	13,794	18,388	16,582	9,649
Connecticut					
New York	1,659,752	1,019,495	1,733,675	1,938,407	1,562,756
New Jersey	373,189	225,372	294,474	264,781	40,663
Pennsylvania	11,348,549	6,987,191	10,918,824	11,272,323	9,806,834
Maryland	411,833	183,502	286,856	326,214	255,816
Virginia	478,771	320,458	391,134	444,976	293,642
Georgia	55,825	24,345	26,072	14,725	1,200
Texas					
Alabama	1,686,674	1,397,014	1,763,617	1,939,147	1,712,443
West Virginia	291,066	65,551	228,282	174,661	291,472
Kentucky	127,946	45,096	86,371	100,509	95,202
Tennessee	393,106	290,826	333,845	397,569	324,648
Ohio	5,250,687	2,861,325	5,561,545	5,752,112	5,310,310
Illinois	2,457,768	1,691,944	2,467,156	2,675,646	2,108,002
Indiana	436,507	348,096	964,289	1,250,103	1,163,932
Michigan					
Wisconsin	322,083	148,938	348,177	307,200	276,807
Minnesota					
Missouri					
Colorado	468,486	313,071	382,766	428,612	305,968
Washington					
California					
Total	25,781,361	15,936,018	25,795,471	27,303,567	23,649,344

Important Baltimore municipal contracts now under consideration are in connection with the new sewerage system. Bids will be received by the Board of Awards until February 14, under contract No. 81, for what is known as a high level interceptor, section No. 5, involving 4170 ft. of brick and concrete sewer, 68 to 82 in. in diameter. On February 7 the board will take bids under contract No. 84 for lateral sewers in Light and Gay streets, involving 2100 ft. of 10 to 18 in. sewer. On the same date bids for 10,500 ft. of 8 to 15 in. sewer pipe, under contract No. 79, for trunk sanitary sewers in Frederick Road, will also be taken. In many instances large quantities of cast-iron pipe fittings, connections, etc., are included in the specifications, of the Sewerage Commission, American Building.

Personal

C. F. Hockley, for the past three years engineer of the power department of the Bethlehem Steel Company, has been appointed superintendent of construction of that department, with headquarters at South Bethlehem, Pa. Prior to his present association he was identified with the Westinghouse Machine Company, East Pittsburgh, Pa.

B. A. Brennan, recently contract manager of the Westinghouse Machine Company, has been appointed sales manager of the power department of the Bethlehem Steel Company, with headquarters at South Bethlehem, Pa. He will be in charge of gas engine and pumping engine sales.

Max H. C. Brombacher sailed January 27 for a business trip through Europe, including Moscow and Riga, in Russia. He is investigating several foreign specialties for American clients with a view to their purchase for importation and placing on this market. Having been engaged in manufacturing all his adult life, he is especially qualified for making an investigation of this character.

It is being announced from the general offices of the Moreland Coke Company, Bessemer Building, Pittsburgh, Pa., by A. C. Speyer, secretary, that W. J. Houston, who is now general sales manager for Ohio and who has charge of the company's offices in the Rockefeller Building, Cleveland, has been promoted, effective February 1, to the position of general sales manager, and will hereafter be located at Pittsburgh. B. W. Wistar, who has been with the Goff-Kirby Coal Company, Cleveland, for the last 10 years, succeeds Mr. Houston as sales manager for the Moreland Company at Cleveland.

George J. Henry, Jr., who for 18 years was connected with the Pelton Water Wheel Company, of San Francisco and New York, for the past six years as chief engineer and sales manager, recently resigned to open an engineering office at 730 Rialto Building, San Francisco. Mr. Henry is the inventor of a number of improvements in hydraulic machinery. His practice will be in hydraulic equipment of power plants, in transmission machinery, oil pumping systems, safety valves, relief valves, rope drives, etc.

A. J. Leischman, of Corry, Pa., has been made manager of the plant of the United States Radiator Company at Edwardsville, Ill., and has removed there with his office force.

William Sodemann has resigned as manager of the Edwardsville branch of the United States Radiator Company, and has reconnected himself with the Sodermann Heat & Power Company, St. Louis, which is affiliated with the United States Radiator Company.

Edward Oldman, for many years superintendent of the Farrar & Trefts Company, Buffalo, N. Y., manufacturer of marine boilers, oil well machinery, etc., has resigned to take the management of the Oldman Boiler Works in that city, of which he is the principal owner. George Oldman, his brother, will succeed him as superintendent of the Farrar & Trefts plant.

E. K. Orr, for many years connected with the Shelby Steel Tube Company and Brown Bros. Mfg. Company, has entered the field of insurance and is associated with the Fidelity & Casualty Company in its Chicago office.

G. P. Wern, M. E., formerly with the Mead-Morrison Mfg. Company, has opened an engineering office at 30 Church street, New York, where he will specialize in hoisting and coal-handling machinery improvements.

John N. Allen, Oliver Building, Pittsburgh, Pa., has been appointed sales agent for that locality for the Hoosier City Boiler Mfg. Company, Indianapolis, Ind.

James B. Brady was elected vice-president of Manning, Maxwell & Moore, Inc., New York City, at a meeting of the board of directors January 26. The office had been previously held by W. O. Jacquette.

Frank J. Patterson, formerly of Cleveland, Ohio, has joined the sales force of the Domhoff & Joyce Company, Cincinnati, pig iron merchant.

T. Coleman Ward, resident manager in Pittsburgh of Hickman, Williams & Co., dealers in pig iron and coke, has gone to Panama.

Charles Fitzgerald has been appointed general sales manager of the Pittsburgh Valve, Foundry & Construction Company, Pittsburgh. He superintended for the company the installation of the high-pressure water system in Baltimore.

Obituary

EDWARD A. DOWNEY, district sales manager for the National Tube Company, with headquarters in St. Louis, Mo., died suddenly January 26 in St. Louis in a taxicab, while being driven from Union Station to his home on his return from a business trip to Chicago. He had been taken ill *en route*. Mr. Downey was 54 years old, and had been with the National Tube Company 33 years. He was born in Boston, Mass., went to St. Louis in 1888 and was made sales manager in 1899. He leaves a widow and five children.

HENRY H. CULVER, vice-president of the Wrought Iron Range Company, died January 22 in St. Louis, Mo., of pneumonia, aged 42 years. He was a son of the founder of the company, was trustee of Culver Military Academy, Culver, Ind., which his father also established, and was a director of the Mechanics American National Bank. He leaves a widow and two daughters.

S. S. SMITH, of Dallas, manager of the General Fire Extinguisher Company of Texas, died suddenly at New Orleans January 20.

WILLIAM J. BLAIR, head of the Blair Tool & Machine Works, 521 Greenwich street, New York City, died at his home in Freeport, Long Island, January 28, aged 54 years. He was born in New York City.

EDWARD TATNALL CANBY, who was vice-president of the old Seidel & Hastings Company, Wilmington, Del., died in New York City January 18, aged 62 years.

GEORGE K. DAUCHY, president of the Dauchy Iron Works, Chicago, died January 20 at his home, aged 83 years. He was born in New York and located in Chicago before the civil war. He served in the Union army and rose to the rank of captain.

A Dealer s Complaint to the Stanley Committee

Richard H. Gray, dealer in iron and steel at San Francisco, appeared before the Stanley Committee at Washington last week and testified that he was unable to fulfill a contract with the Navy Department to supply seamless steel tubes for repairing the boilers of the gunboat Bennigton because the Shelby Steel Tube Company would not furnish him the tubes. He got the contract in 1906. It contained a 60-day forfeiture clause covering failure to deliver material. The Navy Department extended the time to 90 days but he was still unable to obtain the tubes from the Shelby Tube Company or from other manufacturers of tubes. New proposals were called for by the Navy Department and under these the Shelby Steel Tube Company received the contract. The witness's original bid for the tubes was $4385 and that of the Shelby Company was $5498. On December 29, 1906, the Secretary of the Navy ordered that the difference between Gray's price and the bid of the Shelby Tube Company, or $1113, be collected from him.

New Railroad Equipment Orders.—The Canadian Pacific Railroad has ordered 33 locomotives from the American Locomotive Company and will build 75 at its own shops. The Delaware & Hudson has ordered 12 locomotives from the American Locomotive Company. The D., L. & W. is figuring on 40 locomotives. The Bessemer & Lake Erie car inquiry is for 2500 instead of 2000 as recently reported. It asks for 1500 all-steel gondolas, 500 steel underframe box cars and 500 all-steel box cars. The Chicago, Milwaukee & St. Paul is reported to be in the market for 500 refrigerator cars and 500 to 1000 box cars. The Pennsylvania Railroad will build 400 freight cars at its Altoona shops. It is in the market for 150 passenger cars.

The Scullin-Gallagher Iron & Steel Company, St. Louis, Mo., has elected these directors: James Campbell, Festus J. Wade, David R. Francis, John Scullin, Harry Scullin, Frank Perry, S. S. Knight, Charles Gilbert and V. C. Turner. The officers of the past year were re elected.

M. A. Hanna & Co., Cleveland, Ohio, dealers in coal, coke, ore and pig iron, have entered suit against the Pittsburgh Steel Company, Pittsburgh, Pa., for damages for alleged violation of a pig-iron contract.

Baltimore Industrial Notes

J. C. Distler, district manager of the Ames Iron Works, reports an active demand for automatic engines, particularly for those ranging from 75 to 150 hp. Among orders for engines of various types taken the past month were one 17x19 Ames automatic direct-connected with a 150 kw. General Electric generator, for the N. & G. Taylor Company, Cumberland, Md.; a 100-hp. compound for the City Ice Company; a 120-hp. for the Armstrong Manual Training School, Washington, D. C.; a 75-hp., direct-connected with a Westinghouse generator, for the Zimmerman Ice Company, Arlington, Md. Several belted engines have also been sold, including one for the Standard Lime & Stone Company, Stroudsburg Junction, Md., and one for the Empire Coal Mining Company, Baltimore.

The T. C. Bashor Company reports a very satisfactory volume of business in January. All departments of the plant are actively engaged, and overtime is being regularly made in some. This company has recently contracted for a 75-hp. internally fired boiler and a number of tanks, four of which will measure 7x52 ft., for the Davidson Chemical Company. It also has the contract for an extensive power piping system for the Baltimore Stamping & Enameling Company, Herring Run, Md. An order for an 18x36-in. Corliss engine, for the H. D. Dryer Company, has also been entered. Orders for a number of steel stacks have been taken, as have also orders for machinery equipment for several fish factories. Considerable inquiry for power equipment is noted, and the outlook for continued active conditions is encouraging.

Dietrick Brothers note conditions rather quiet, as far as the demand for structural steel work is concerned. Inquiry is light and confined to small buildings. A recent contract taken was for the structural work in connection with the new factory building for L. Grief & Sons, involving about 100 tons of material.

Crook, Kries & Co. have the contract for the pressure piping, auxiliary connections, fittings, tanks and separators for the new high-pressure fire-line pumping station on South, near Pratt street, and have also booked orders for two 175-hp. Ball (Erie) engines, to be installed for the Monumental Brewing Company. General business is reported active, with negotiations for several power installations under way.

The New York Central Iron Works Company, Hagerstown, Md., has begun operations at its new plant. It will manufacture the Dunning line of heating boilers for steam and hot water heating, pneumatic tanks and tanks for the storage of air, water and gas. The officers of the company are: D. E. Dempsey, president; O. J. C. Rose, vice-president, and C. E. Williams, secretary-treasurer.

The Baltimore Retort & Fire Brick Company is running its plant at practically full capacity. A number of good orders have been taken and the outlook for spring business is considered very encouraging.

Definite arrangements have been made by which the annual convention of the American Foundrymen's Association will be held in Buffalo, N. Y., on June 4, 5, 6 and 7. It is probable that the exhibition of the Foundry & Machine Exhibition Company, which has become such an important means of emphasizing the march of progress in foundry equipment, will take place in Buffalo at the same time.

The Portsmouth Steel Company, Portsmouth, Ohio, has recently finished the building of two jobbing mills, and they are now in operation. It has five hot sheet mills in course of erection which will be finished about March 1, and intends to roll black and galvanized sheets up to No. 30.

The Alan Wood Iron & Steel Company is making considerable improvements in its sheet mills at Conshohocken, Pa. New boilers and modern equipment for the handling of materials are being installed.

The new 617-ft. freight boat, the William P. Snyder, Jr., one of the largest on the Great Lakes, was launched January 27 at the Ecorse yards of the Great Lakes Engineering Works.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Employer's Duty to Furnish Safe Appliances.—An employer is liable for injury to an employee caused by an unsuitable appliance furnished by a foreman, though the employer had provided other appliances, especially if their whereabouts are unknown. (St. Louis Court of Appeals, Gale vs. Helmbacher Forge & Rolling Mills Company, 140 Southwestern Reporter 77.)

Excessiveness of Recovery for Personal Injury.—Judgment for $750 is not excessive recovery for personal injury to a machinist's helper, where part of the muscle of one of his arms was torn away and the remainder of the arm was cut and bruised. (Kentucky Court of Appeals, Lancaster vs. Gunther-Wright Machine Company, 140 Southwestern Reporter 58.)

When an Employer Is Not Liable.—A workman injured while attempting to place a belt on a rapidly revolving shaft cannot recover from the employer, though the latter failed to provide a belt shifter, as required by law, if the workman chose an obviously dangerous way of doing the work when he knew that a reasonably safe way was open to him. (Pennsylvania Supreme Court, Solt vs. Williamsport Radiator Company, 80 Atlantic Reporter 1119.)

Employer's Duty Concerning Warning to Employees Against Dangers.—An employer's warning to his employees against dangers of the work must be graduated according to their age, experience and capacity, and should point out the nature and extent of the risks involved. (Connecticut Supreme Court of Errors, Belevicze vs. Platt Brothers & Co., 81 Atlantic Reporter 339.)

Employer's Duty to Safeguard Machinery.—Under the statutes of Wisconsin an employer must safeguard a set-screw which projects from a revolving shaft if it is so located as to be dangerous to employees. (Wisconsin Supreme Court, Monahan vs. Fairbanks-Morse Mfg. Company, 132 Northwestern Reporter, 983.)

Assumption of Risk by Employee in Violating a Rule.—An employee does not necessarily assume the risk of being injured while violating a rule prescribed by the employer if the rule has been habitually violated with the employer's knowledge. (Michigan Supreme Court, Johnson vs. Burke, 132 Northwestern Reporter 1017.)

Liability for Death of Workman Caught by Revolving Set Screw.—In Kentucky an employer who fails to provide a belt shifter is liable for the death of an employee under 16 years old, caused by his being caught by a set screw on a revolving shaft, while attempting to adjust a belt on a pulley. (Kentucky Court of Appeals, Higgins Mfg. Company vs. Griesinger, 139 Southwestern Reporter, 1059.)

Right to Patent.—Discovery of a new use for a patented device is not patentable. (United States Circuit Court, Eastern District of Michigan, Wm. B. Mershon & Co. vs. Bay City Box & Lumber Company, 189 Federal Reporter, 741.)

Assumption of Risk by Workman of Being Caught by Revolving Shaft.—An employee assumes the risk of his clothing catching on a revolving shaft at which he is working, if the danger is obvious. (Massachusetts Supreme Judicial Court, Goulding vs. Eastern Bridge & Structural Company, 96 Northeastern Reporter, 71.)

Measure of Damages for Breach of Contract to Buy.—The measure of damages for a buyer's refusal to accept delivery of goods, after receiving part, is the contract price, less the value of the goods remaining on the seller's hands. (Pennsylvania Supreme Court, Imperial Rolling Screen Company vs. Steinfeld Brothers, 81 Atlantic Reporter 413.)

Right to Rely Upon Representation as to Size of Exhibited Article.—One in contracting to buy three-sixteenths inch bolts was not entitled to rely upon a misrepresentation innocently made by a salesman that an exhibited sample, which was actually three-eighths inch in size, was three-sixteenths, since the actual size was determinable by measurement. Hence, the buyer is liable for the price of the smaller bolts shipped under the contract, though he intended to buy the larger size. (Wisconsin Supreme Court, O. L. Packard Machinery Company vs. Schweiger, 132 Northwestern Reporter 606.)

What Constitutes Unfair Competition.—To constitute unfair competition in law there must be an attempt to pass off one manufacturer's or seller's goods as those of another. (United States Circuit Court of Appeals, Sixth Circuit, Rathbone, Sard & Co. vs. Champion Steel Range Company, 189 Federal Reporter 26.)

Trade Publications

Iron and Steel and Machinery.—Joseph T. Ryerson & Son, Chicago, Ill. January issue of the company's monthly stock list. Covers the various lines of iron and steel handled. The cover is a reproduction of the company's advertisement which filled the front cover page of *The Iron Age*, January 4, 1912. This comprised a bird's-eye view of the plant and was selected as the result of a competition among a number of advertising artists in New York City.

High Speed Pumping Engines.—Henry R. Worthington, 115 Broadway, New York City. Bulletin No. W-188. Gives an extended description of the Worthington horizontal triplex-expansion high duty pumping engine installed in the Hope Station of the Providence, R. I., water works. This engine, an illustrated description of which appeared in *The Iron Age*, October 5, 1911, has a capacity of 10,000,000 gal. per 24 hours against a head of 85 lb. per square inch and its design represents the latest practice in pumping engines of this type. One of the specially interesting features is the high duty attachment involving the use of compensating cylinders to take the place of a flywheel, an arrangement which is said to be preferable to a flywheel since the power exerted increases in almost exact ratio with the decrease of the power of the expanding steam. Reports of the duty trials in which the guaranteed full load duty was exceeded by 4.5 per cent. and the reduced capacity duty by 12.5 per cent. are included. A similar engine which was installed at Fall River, Mass., is also shown and described.

Wires and Cables.—Hazard Mfg. Company, Wilkes-Barre, Pa. Two booklets. Give general descriptions and specifications for the Penn New Code and the Hazard 30 per cent. Para and the Keystone 25 per cent. Para wires and cables. The former contains the new National Board of Fire Underwriters' specifications for insulated wires and cables.

Industrial Railway Equipment.—Ernst Wiener Company, 46 Church street, New York. Folder, entitled "Carrying the Burdens of the World." Points out the various types of industrial railway equipment which this company is prepared to furnish for gas plants and foundries. These include rails, frogs, switches, portable and cast-iron plate tracks, turntables, track scales and cars of all descriptions. Views of the track as well as those of several types of cars are included.

Induction Motor.—Crocker-Wheeler Company, Ampere, N. J. Booklet. Explains how the patented magnetic bridges employed in the construction of this motor influence its operating characteristics and the mechanical durability and construction. This magnetic bridge is used to close the stator slot in place of the wooden wedge ordinarily employed. One of the advantages of this bridge is to shorten the gap between the stator and the rotor by providing a straight path for the magnetic flux to travel while to prevent leakage across the ends of adjacent teeth the bridge is divided in the middle by a long slot. The booklet contains a number of illustrations showing how the bridge is used and the improved distribution of the magnetic flux following its employment. Views of the motor in various stages of its construction are also included.

Boiler Blow-Off Valve.—Lytton Mfg. Corporation, Franklin, Va. Circular. Lists the various sizes of the Lytton boiler blow-off valve which is designed for frequent operation and hard service. The special features of this valve are full protection of the valve and seat when open, accurate register of the ports so that no scale or mud comes in contact with the faced surfaces of the valve, a free discharge and the employment of only two parts which are subject to wear. Half-tone and line engravings show the construction of the valve.

Cloth Pinions.—General Electric Company, Schenectady, N. Y. Bulletin No. 4878. Devoted to cloth pinions which are said to possess the advantages of great tooth strength, noiseless operation, freedom from damage by exposure, elasticity of teeth, self-lubrication and long life. The various styles and sizes of these pinions are illustrated in the bulletin.

Railway Nut Lock.—May & Turner Company, Atlanta, Ga. Circular. Deals with Burrough's railway nut lock which consists of one piece of iron having square, upset surfaces fitting beneath each nut. This lock is held in place by the spikes fastening the rail to the ties in a position to lock the nut positively, thus preventing the bolts from wearing and giving increased strength to the joint.

Taps and Dies.—Butterfield & Co., Derby Line, Vt. Catalogue. Size, 6 x 9 in., pages 96. This is the company's 1911 catalogue, describing and illustrating taps, screw plates, stocks and dies and hand and machine reamers in a number of different styles for various uses. The general arrangement of the catalogue is to illustrate each one of the articles, followed by a brief description and a table of the sizes in which it can be secured. A very comprehensive index completes the catalogue.

Storage Battery Trucks.—Jeffrey Mfg. Company, Columbus, Ohio. Bulletin No. 13A. Illustrates a storage battery truck for handling package material or hauling cars which have been loaded with castings, lumber or any other kind of material. The construction of the truck is described, and there are a number of views showing it in use in various plants. An illustrated description of this truck appeared in *The Iron Age* August 19, 1909.

Expander.—Allis-Chalmers Company, Milwaukee, Wis. Leaflet No. 4027. Deals with the Acco expander ring for expanding packing leathers in air brake cylinders. The ring, which is interchangeable with the old style ring, is described at some length, and two line drawings show how the rings hold the leather in position.

Presses.—Standard Machinery Company, 7 Beverly street, Providence, R. I. Catalogue. This is the company's 1912 catalogue describing and illustrating a line of presses of various types. These presses include single and double acting presses, machines to notch armature disks, cam presses, embossing presses and a number of other types. In general the makeup of the catalogue is to illustrate the press and give a brief description of it, followed by a table of dimensions and specifications.

Ventilation.—Pullman Automatic Ventilator Mfg. Company, York, Pa. Circular. Points out the advantages of using the Pullman automatic ventilator for windows and this company's cowls on roofs. This latter device is built of galvanized iron, either with or without a fire retarding damper which is held in place by a fusible link.

Fuses.—A. F. Daum Company, Pittsburgh, Pa. Mailing card. Covers a line of refillable cartridge fuse shells for electric light and power circuits which are made in the various standard sizes. These shells are made with both blade and round contacts. Both styles of contacts together with the two types of clips are illustrated.

Roofing.—Western Elaterite Roofing Company, 841 Equitable Building, Denver, Col. Pamphlet. Concerned with the Elaterite roofing for all classes of structures. The engravings show the various types of buildings for which this material has been furnished.

Calendar.—Ironsides Company, Columbus, Ohio. Wall hanger measuring 16 x 18 in. The company's trade mark is reproduced above the pad, which, although small, is nevertheless very distinct, and the remainder of the space shows some of the company's specialties.

Steam Traps.—B. F. Sturtevant Company, Hyde Park, Mass. Mailing card. Calls attention to the Flinn differential steam trap, which works upon a principle of the difference in weight of one column of water and another column of water aided by a spring. Some of the special features claimed for this trap are that it will handle water at any temperature, works in any pressure below a maximum without readjustment, is not affected by vibration or oscillation, is adapted to the highest pressure and is free from wire drawing. Exterior and sectional views of the trap are given, together with a table of the capacities of the different sizes.

Hoists and Trolleys.—Yale & Towne Mfg. Company, 9 Murray street, New York. Pamphlet. Concerned with the Triplex and differential chain blocks and electric hoists of this company and the trolleys of the Brown Hoisting Machinery Company, for which it is the sales agent. All of the different pieces are illustrated and briefly described. The construction of the Triplex block is given in some detail and there is a series of interesting comparisons of the hoisting speed possible with the three types of blocks. An illustrated description of some of the company's hoists and trolley appeared in *The Iron Age*, January 5, 1911.

Power Chains and Sprockets.—Diamond Chain & Mfg. Company, Indianapolis, Ind. Book. Size, 6 x 9 in.; pages, 96. Is a profusely illustrated treatise and reference book on the subject. The use and design of chain drives are discussed, followed by instructions on the care of the chain and the sprockets and their use on motor cars. Following this, the construction of the Diamond chain is taken up and illustrated with numerous half-tones of the various types. Several tables of useful information complete the book.

Gear Cutting.—Gould & Eberhardt, Newark, N. J. Chart with sliding scale. One side of the slide contains a guide for various cutter speeds for different diameters of carbon and high-speed steel cutters ranging from 2 to 8 in. The other side gives the equivalent circular pitch, the thickness on the pitch line, the addendum and the total tooth depth for various diametral pitches from 1 to 16.

Steels.—Crucible Steel Company of America, Oliver Building, Pittsburgh, Pa. Folder. Relates to the company's Rex AA high-speed steel and its other brands, Black Diamond, Crescent, Sanderson, Howe-Brown, Singer-Nimick, LaBelle and Atha. Particular attention is given to the merits of the Rex AA steel, which is said to combine a maximum of hardness, toughness, endurance and strength.

Steam Specialties.—Watson & McDaniel Company, 146 North Seventh street, Philadelphia, Pa. Catalogue No. 21. Concerned with a line of steam specialties which includes steam traps, pilot-operated reducing valve, steam pump governor, exhaust heads, air and gas reducing valves, syphon pump, steam separators and blow-off valve. All of these are illustrated and briefly described with tables of sizes and prices.

Graphic Meters.—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Circular No. 1131. Describes graphic meters for switchboard service. Illustrations of the meters together with typical charts taken from them and indicating the various uses to which these instruments can be advantageously put are shown.

The Machinery Markets

In no part of the country is there any great activity in the machinery trade, although reports are of a better character than they were a week ago. The better tendency is especially notable in machine tool centers. In New York there has been a little falling off in inquiries, but excellent orders have been received in liquidation of demands made known to the trade in December. January has run ahead of December with the trade in New York. There has been little railroad business, most of the buying having been done by manufacturers and the city of Newark, which placed substantial orders for its manual training school. In Cleveland business has improved with many sales of single tools and more inquiries. Cincinnati conditions are more encouraging in view of better domestic inquiry and a betterment in exports. Buying in Philadelphia has been quieter and the call has been principally for special equipment. Baltimore notes a demand for ice-making machinery. In New England, where there was some talk a few weeks ago of cutting prices, the tendency in the last week has been toward stronger prices, but with intermittent demands. Detroit has been rather disappointed in January business, but is cheered by new inquiries. The business in St. Louis continues good, although with no especially big transactions. Texas reports conditions as satisfactory with a good outlook for dredging machinery, and the Pacific coast has seen an increasing activity in all lines of machinery. Business in most lines is below normal in the South, but belief is strong that greater activity is near.

New York

NEW YORK, January 31, 1912.

Actual sales of machinery in the month of January have been good and the cause of a great deal of satisfaction to the New York trade. Several dealers report that January ran ahead of December in actual business and December was called a good month. Most of the recent transactions have been the closing of December inquiries. It is admitted generally that within the last week or two there has been a falling off in inquiries, but enough are pending to develop a good bit of business and more are bound to come shortly. Despite the use of the word "depression" in recent discussions on trade conditions, machinery men up to the present have seen no justification for it since the trend toward better things recently commenced. Energetic efforts are making sales. The New York Air Brake Company was recently in the market for a small list of tools for its Watertown shops. Some buying of considerable importance has been done in the last week or 10 days by the Newark, N. J., Commercial and Manual Training School, which placed orders for equipment for its Central High School, including both metal and wood-working machinery. Several weeks ago orders were placed for the East Side branch of the same school, which was at that time referred to. The East Side school is now completed except for transmission machinery, which is now being installed. The Westinghouse Electric & Mfg. Company has also been in the market for tools for its Newark, N. J., plant. No substantial orders have been placed as yet by the Delaware & Hudson Company on its big list for its Watervliet shop. The list has been modified in many particulars since first announced. The Continuous Rail Company, 17 Battery place, New York, is asking bids on an electric drive machine of special design for crimping the top of steel rails which it manufactures. The Seaboard Air Line is in the market for a 42-in. boring mill for its Savannah shop. Firms which do an export business have done especially well of late.

The Town Council of the Borough of Emaus, Pa., is asking for sealed bids to be submitted before 8 p. m., February 5, for the installation in the pumping station of the borough of a double-action pump with a speed of from 50 to 100 r.p.m. and capable of delivering from 200 to 400 gal. of water per minute. Bids must be accompanied by a certified check of 10 per cent. of the amount of the bid and forwarded to R. S. Stoneback, secretary, Emaus, Pa. The Town Council also will receive under the same conditions bids for one 80-hp. horizontal steam boiler, including all accessories. Complete specifications must accompany bids.

The Yatman Rubber Company, Newark, N. J., has had plans prepared for a factory building, 55 x 77 ft., two stories, of brick construction. The building is in the nature of a reconstruction of its present plant and equipment details are not yet determined. R. W. Erler, 45 Clinton street, is the architect.

The Globe Malleable Iron & Steel Company, Syracuse, N. Y., suffered a total loss of its malleable plant by fire January 23. S. J. Marshall, treasurer of the company, states that it is planning to rebuild the plant and erect as nearly a fireproof building as possible.

The municipality of Manhasset, N. Y., will receive bids until February 15 for the construction of two 8-in. wells, a brick pumping station, three sets of fuel oil engines, triplex pumps and accessories and about 21 miles of cast iron pipe, hydrants, etc.

The J. A. Rickard Company, Schenectady, N. Y., has been incorporated with a capital stock of $72,000 to manufacture guns, firearms, ammunition, etc. J. A. Rickard, Jesse A. Rickard and B. C. Wheeler, Schenectady, are the incorporators.

The Niagara County Home Telephone Company, Lockport, N. Y., Henry Shannon, manager, is arranging for the construction and equipment of a new plant in that city at an estimated cost of about $40,000.

The Village Board of Trustees, Chatham, N. Y., has authorized the securing of estimates for construction of a sewage disposal plant in connection with the installation of a sewerage system as recommended by Health Officer Dr. I. C. Washburn, Albany. A special election will be called to vote on the matter.

The Republic Chemical Company, Inc., Millbrook, N. Y., has been incorporated with a capital stock of $1,000,000 and will engage in the manufacture of chemicals, etc. L. Riggs, Jr., L. J. Luse and J. Piper, New York City, are the directors of the company.

The Stilson Roller Bearing Company, Jamestown, N. Y., has been incorporated with a capital stock of $100,000 to manufacture roller journal bearings and arrangements are being made for a plant. A. A. Sandberg, N. A. Johnson and F. M. Curtis, Jamestown, are the directors.

The Cox Brass Mfg. Company, Albany, N. Y., has let the contract for the three-story addition to be made to its factory at Van Worst and North Pearl streets.

A. Nowak & Son, Buffalo, N. Y., will rebuild and equip the grain elevator and feed mill at its plant, Broadway and New York Central Railroad belt line, recently destroyed by fire.

The item in these columns last week in reference to the municipal water works at Troy, N. Y., was inaccurate, or rather incomplete. It should have stated that the McDonough Construction Company, Troy, which has the contract for construction of a dam and reservoir for the water-works system of the city of Troy is desirous, owing to the death of the president and general manager of the company, of securing a contractor to finish the construction. The unfinished portion of the work amounts approximately to $140,000. Engineers' plans and specifications can be seen at the offices of the construction company. The plant for construction work is on the ground.

The Woodstock Pneumatic Tool & Machine Company, Ltd., Woodstock, Ont., has been incorporated to manufacture pneumatic tools, etc. The directors are Dennis W. Karn, Robt. G. Bickerton and Wm. G. Parke.

Business Changes

The Frevert Machinery Company, for six years at 18 Dey street, New York, dealer in new and second-hand machine tools, will be located after March 1 at 38 Vesey street, New York. The growth of the company's business compelled it to obtain larger quarters.

New England

BOSTON, MASS., January 30, 1912.

Business conditions have changed but little in this territory. The manufacturers and dealers see no reason for altering their belief that the spring should see a considerable improvement. The tendency of prices is upward. The receipt of orders is by no means steady as yet, the demand being spasmodic in most lines. Some branches of the metal industry are very busy indeed. For example, the typewriter manufacturers of Hartford, Conn., are hardly able to keep up with their orders, everything being sold before it is completed. The hardware manufacturing industry is running along at a normal rate of production. The most important announcement for the machinery people for some time is that of the Stevens-Duryea Company that a very large plant will be erected at Springfield, Mass., the first unit embracing 160,000 sq. ft. of floor space, to be occupied as soon as possible this year. The recent growth of the automobile industry in New England has not been large, excepting among manufacturers of accessories and parts, and so radical a step forward as that of the Chicopee Falls company will be welcomed.

W. H. Whiteside, president of the Stevens-Duryea Company, has issued the following statement: "Due to the steady growth of its business, the Stevens-Duryea Company for some time has been planning an extension of its manufacturing facilities in Chicopee Falls. However, after considering the superior advantages as afforded in a 40-acre tract of land in East Springfield, the company has just acquired this land, which is on the Athol branch of the Boston & Albany Railroad and the new Hampden branch of the New York, New Haven & Hartford. It will begin the construction of a large, modern plant as soon as the weather conditions will permit, and will have completed and ready for occupancy by June 1 one of the buildings, which will be four stories, 80 x 500 ft., containing a floor area of 160,000 sq. ft." A report that the company had a large industrial project in mind has been current for some time, but the rumors were too vague to be taken seriously. The verification is one of much interest to the machinery and supply trade, for the company has always been a buyer of high grade equipment and undoubtedly the list of machinery for the new plant will be a large one. The site is just east of the works of the Millett Brass Company and the Springfield Crude Oil Engine Company. No announcement is made of the future of the Chicopee Falls plant.

The Taunton & New Bedford Copper Company will immediately submit to contractors plans for the new rolling mill which will be erected at New Bedford. The purpose is to complete the building as early in the spring as possible.

The American Thermos Bottle Company is planning the erection of a large plant and the city of Norwich, Conn., is considered as the site. A condition is that $75,000 be raised in the city, and of that sum $30,000 has already been pledged.

The American Thread Company is planning to equip much of its large plant at Holyoke, Mass., with electric drive.

The New Haven Chamber of Commerce is making arrangements for the establishment of a permanent industrial exposition, the use of the Auditorium on Chapel street between State and Olive streets being contemplated. The purpose is to show to visitors the products of local manufacturing plants.

Hartford, Conn., is to have a "Home Industry Week" which will be conducted by the local Chamber of Commerce, February 19 to 23, which is the time of the convention of the Connecticut Valley Deeper Water Ways Association, which will be held at the state capitol. Local products, including working displays, will be shown in store windows on Main and Asylum streets, 100 windows being available for the purpose. Most of the important local manufacturing houses will be represented, including those in machinery and other metal lines.

The National India Rubber Company, Bristol, R. I., one of the subsidiaries of the United States Rubber Company, has sold to a Cleveland company three departments of its plant, comprising mechanical fabric, fire hose and druggists' supplies.

The plant of the Standard Veneer Company, Stockholm, Maine, was destroyed by fire January 26 with a loss of $50,000.

The Potter & Johnston Machine Company, Pawtucket, R. I., has begun to market its new model 7-A automatic chucking machine and has already built and shipped about 50 of them. The export trade of the company still keeps good and the outlook for continued active business abroad is very encouraging. The home trade is rather quiet.

The Sturtevant Mill Company, Harrison Square, Boston, Mass., manufacturer of ore and similar machinery, found the year 1911 a very satisfactory one, with an increase in business of nearly 50 per cent., which is quite exceptional, considering general business conditions. The last two months, however, business has been poor, but is now picking up to some extent, and the company expects to be busy in the spring. It was planning to extend its plant to double the size, but owing to the recent recessions in business this has been postponed probably until next year.

Simon MacKay, who has been superintendent of the Union Twist Drill Company, Athol, Mass., has been made works manager of the L. S. Starrett Company, of that town.

The Hartford Machine Screw Company, Hartford, Conn., has begun the manufacture of a combined water and air pump for automobile use, and also a single air compressor. These pumps are being installed in some of the leading American cars, and the promise is that next year's demand will be still greater.

The Standard Machine Company, Providence, R. I., has bought out a new mill for the cold rolling of sheet steel. It is a powerful machine, weighing with balance wheel and motor 29,000 lb. The top and bottom rolls are 11 in. in diameter with 12-in. face.

Philadelphia

PHILADELPHIA, PA., January 30, 1912.

Buying the past week has been quieter. The demand appears to run largely to equipment of a special nature rather than to the standard types of tools. Very little business involving any large quantity of tools for general equipment purposes is under negotiation, some of the requirements recently reported having not yet developed into definite inquiries. A fair volume of electric crane business is pending and comparatively good inquiries for disk grinders are reported by several merchants. Railroads are but very light inquirers for tools.

Industrial conditions in this district are far from satisfactory. The local locomotive plant is operating four days a week, and as orders are reported light, indications point to further curtailment. The shipyards, however, are quite busy and are bidding on a large amount of new work. Contracts for six vessels have been placed with Delaware yards recently, and sufficient work is on hand to keep them busy for a long time. Most machine tool builders continue to operate on a very restricted basis; here and there a special tool and machinery builder is operating at full capacity, but such cases are few. A moderate business has been done in engines and pumps; some fair orders for boilers are noted, particularly for marine work. The second-hand machinery market continues dull. Foundry activity shows little change, although some steel casting plants report a slightly better run of orders, but as a rule business is still very irregular.

The Pennsylvania Railroad has an inquiry out for an eight-spindle grinder.

The William Steele & Sons Company, engineer and contractor, is taking bids for a group of four buildings to be erected for Isaac A. Sheppard & Sons, stove manufacturers, to be built on a site recently acquired at Erie avenue and Sepviva street. The group includes buildings of one, two and three stories, of brick and concrete. The plant will be fully equipped for the manufacture of stoves and furnaces, as well as general castings.

Reports are current, but not confirmed, that the old shipyard of the John Roach Shipbuilding Company, Chester, Pa., will be re-equipped and put in operation by the Standard Oil Company, as a repair yard for its various vessels.

The United Motors Company, Camden, N. J., has been incorporated with a capital stock of $125,000. It will take over several garages in Camden and vicinity and engage in general repair work. While some machinery equipment was taken over, it is the intention of the new concern to materially increase its equipment in the near future. William B. Macdonald, Marcus H. Carroll and Harry Berger are interested.

The Reading Crane & Hoist Company, Reading, Pa., reports a fair run of new business, and is operating its plant 51 hours a week. It recently delivered two six-ton cranes to the Bosch Magneto Company, Springfield, Mass.; one to the New York & Pennsylvania Company, Lock Haven, Pa., and one to the DeGrasse

Paper Company, Pyrites, N. Y. Deliveries have also been made to the Brompton Pulp & Paper Company, East Angus, Quebec; Wayagamack Pulp & Paper Company, Three Rivers, Canada, and the Central Pennsylvania Traction Company, Harrisburg, Pa. A large crane is now under construction for Cuba.

The Pigeon Machine Company, Jasper and Orleans streets, has been incorporated with a capital stock of $75,000. This concern, which manufactures textile machinery, was formerly conducted as a copartnership by Albert M. and Oscar W. Pigeon. Present plans do not include any immediate extensions or improvements to the plant.

The Hamerly Tool & Machine Company has been incorporated under Delaware laws with a capital stock of $500,000. Edward C. Boiser and Francis B. Hamerly, Buffalo, N. Y.; L. Clark Raymond, Welland, Ontario, and Edwin R. Cochran, Wilmington, Del., are named as incorporators.

Baltimore

BALTIMORE, MD., January 30, 1912.

While the opening month of the year usually presages quiet conditions business in a number of lines has exceeded anticipation. In many cases gains over the December rate are reported, particularly in power equipment and special machinery. In machine tool lines 1911 showed but a fair volume of business, although the outlook is more encouraging. Purchases of machine tools are still confined closely to small lots and individual tools, particularly in metal working equipment, although the prospect of increased buying of woodworking tools is more promising. Ice making plants are still purchasing and making further inquiries for varied classes of equipment. There is an absence of any marked demand for machine tools coming from the railroads; inquiries are usually for single tools for replacement purposes, and even business of that class develops but slowly. There has been a comparatively good demand for power equipment; a number of contracts for boilers and engines have been closed and considerable business is pending, the major portion of which is for equipment ranging from 75 to 150 hp. Manufacturers of boilers and tanks have closed some good contracts and are, for the most part, actively engaged.

Fabricators of structural material have had a lean month. There is an absence of any large projects and the bulk of the contracts entered cover requirements of less than 100 tons. For the most part structural material shops are operating with reduced forces. A moderate amount of work is on engineers' and architects' boards, and the trade looks forward to more active conditions when the building season opens.

The machinery trade is more optimistic in its views, and the belief is generally expressed that the volume of business this year will be better than in 1911.

The Ellicott Machine Company has placed contracts for the structural steel work for a new machine shop, 50 x 160 ft. Some uncertainty exists as to whether it will be located at the present plant at Bush and Severn streets or at a new site recently purchased, comprising a portion of the old Quarantine property. This will be decided at an early date. Considerable machinery and tool equipment will be required for the new shop. Nothing of a definite nature has yet been decided upon.

Manuel Hendler is having plans prepared by I. K. Schanze, engineer, for a cold storage plant to be erected at Baltimore and East streets. Tentative plans call for a building 100 x 200 ft.

Wm. J. O'Brien, receiver for the Aumen Machinery & Supply Company, will wind up the affairs of that company and discontinue the business. The stock of tools, supplies, etc., being carried at its warerooms, 324 North Holliday street, is being sold.

The Tube Bending & Polishing Machine Company is now placing on the market an automatic grinding and polishing machine, manufactured under the L. H. Brinkman patents, for polishing pipe, tubes and rods. This company is developing several bending and flanging machines, one type being practically completed. Its new plant is now fully equipped and operating at practically full capacity.

The Aumen Machinery Company, of which W. G. Aumen is president and treasurer, Edw. L. Stringer is vice-president and W. J. Leppert is secretary, has been formed and has taken quarters for showrooms and offices at 107 East Lombard street. The officers named were for a number of years connected with the late Aumen Machinery & Supply Company. The new company will represent the following concerns in the Baltimore-Washington district: American Tool Works Company, Cincinnati, Ohio, lathes and planers; American Woodworking Machinery Company, Rochester, N. Y., woodworking machinery and tools; Hoffer Mfg. Company, Freeport, Ill., drills; Oesterlein Machine Company, Cincinnati, Ohio, milling machines; Union Steam Pump Company and Advance Pump & Compressor Company, Battle Creek, Mich., pumps and compressors; American Pulley Company, Philadelphia, Pa.; Automatic Refrigerating Company, Hartford, Conn., and others. A full line of mill and machine shop supplies will be carried in stock.

Riggs, Distler & Stringer, engineers, have the contract for the supervision and installation of the power equipment for the new addition to the Maryland Casualty Building. Two 100-hp. Heine boilers will be installed. Considerable pumping machinery for the plant still remains to be purchased. They are finishing up their contract for the installation of three 150-hp. engines, direct connected to Ft. Wayne a. c. generators, and two 400-hp. Edgemoor boilers, equipped with Wetzell stokers, for the Springfield State Hospital. They are also completing the installation of a 75-hp. engine, direct connected with a General Electric generator, for the Maryland Asylum & Training School for the Feeble Minded. Orders for several Spencer turbine vacuum cleaning installations are also reported. These engineers are figuring on a number of power installations and report conditions for prospective business as quite favorable.

The Furth Concrete Construction Company has had plans prepared and will erect a machine shop and office on a tract recently purchased on the old Quarantine site. The purchase of tools for the equipment of this plant will not be taken up for at least 30 days.

L. Grief & Bro. have let the contract for the building of their new manufacturing plant at Eager place and Milton avenue. The building will be 70 x 155 ft., three stories. An order for one 125-hp. boiler, which will be installed in the building, has been let to a local builder. Electricity will be temporarily used for power purposes, and later on, probably in six months, the question of installing a power plant will be taken up.

John B. Adt is extremely busy in all departments The 1911 business showed an increase of 45 per cent. over the previous year, and the same active rate has been maintained the past month. A number of orders have recently been taken for special machinery, particularly for tobacco working purposes, both for export as well as domestic delivery. In the supply department business has been quite active, showing a material gain over the closing month of 1911. Good inquiry for elevators is reported, but close slowly. The plant is operating overtime in several departments, and while some few machine tool purchases have been recently made additional purchases of equipment are contemplated in the near future.

D. B. Martin & Co. are having plans prepared for a fertilizer plant for the Union Abattoir Company, on Wilkins avenue, to replace that recently destroyed by fire.

Chicago

CHICAGO, ILL., January 30, 1912.

The Page Engineering Company, Chicago, has been incorporated with a capital stock of $25,000, and will do a general contracting and construction business. The incorporators are John W. Page, Blake C. Smith and Rupert J. Barry.

The Metallic Smelting & Refining Company, Chicago, has been incorporated with a capital stock of $12,000 by Charles R. Holton, R. D. Whitmore and Frank A. Helmer. The company will engage in the smelting and refining of metals.

The B. & L. Caster Axle Company, Chicago, has been organized by A. S. Burnell, F. E. Lyon and B. J. Chrisup to manufacture and deal in automobiles and automobile parts. The capital stock of the company is $250,000.

The Eagle Claw Wrench Company, Chicago, with a capital stock of $25,000, will manufacture and deal in tools and machinery. It was organized by Chas. A. Burgess, M. D. Walworth and Wm. Brown.

The Dodge Corrugated Iron Company, Chicago, has been licensed to do a general manufacturing and mercantile business with an authorized capital stock of $10,000. The incorporators are A. W. Dowler, Lena Dowler and Geo. N. B. Lowes.

The Clinch Nut Company, Chicago, with an authorized capital stock of $75,000, has been incorporated by David H. Fletcher, Perry I. Croner and Norman Dietrich.

The Geo. W. Jackson Mfg. Company, Chicago, has been organized by John A. Bloomington, Robert B. Thorne and C. C. Bruer, with a capital stock of $150,000, to manufacture, sell and distribute machinery.

The Rockford Desk Company, Rockford, Ill., has decided to rebuild its plant recently destroyed by fire, and is now engaged in the securing of a new site and in the preparation of plans for the new buildings.

The American Foundry & Furnace Company, Bloomington, Ill., is enlarging its plant with a brick addition, 40 x 50 ft.

The Hydraulic Motor Vehicle Company, Milwaukee, Wis., recently incorporated with a capital stock of $15,000, is planning to build a factory this spring.

The Berlin Machine Works, Beloit, Wis., announces the preparation of plans for the construction during this year of an additional building, 275 x 294 ft.

The Vulcan Mfg. Company, Fond du Lac, Wis., is contemplating important improvements and additions to its plant. The company is a fabricator of structural steel.

The Davis Mfg. Company, Milwaukee, Wis., has prepared plans for the erection of a factory addition, 52 x 186 ft., two stories.

The Armstrong Mfg. Company, Waterloo, Iowa,, is contemplating the establishment of a plant at Charles City, Iowa.

The Western Steel Foundry Company, headed by W. H. Kistler, has purchased the Colorado Gray Iron Foundry of Denver, Colo., and will rebuild the plant in a manner suitable for the installation of a steel foundry.

The Northwest Thrasher Company, Stillwater, Minn., has passed to the control of Eastern capitalists, Charles W. Fold, of Chicago, being elected president. The new management announces that the mechanical equipment of the plant will be doubled at once.

Cleveland

CLEVELAND, OHIO, January 30, 1912.

Business with local machine tool builders improved considerably during the week. Quite a satisfactory volume of orders came out, these in nearly all cases being for single tools. The largest orders were for not over three or four tools. Inquiries are somewhat more active. One Cleveland manufacturer has a list out, including 10 standard tools that will amount to about $12,000. A local maker of drilling machinery reports a good volume of orders. The demand for automatic screw machinery has picked up somewhat and builders of machine tools and general machinery generally report some improvement and a more favorable outlook. The demand for locomotive cranes and some other lines of handling equipment is quite good. A Cleveland machine tool dealer has sold this month four large boring mills, three of which were wanted for the rubber tire industry in Akron, Ohio.

The Winton Gas Engine Mfg. Company, Cleveland, Ohio, has been incorporated with a capital stock of $200,000 by Alexander Winton, president of the Winton Motor Carriage Company, and others. The new company will erect a plant 80 x 300 ft., one story, near the Winton automobile plant, for the manufacture of marine and stationary gas engines, of the 6-cylinder type, from 200 to 400 hp., designed by Mr. Winton, who will be at the head of the company.

The Browning Engineering Company, Cleveland, reports a good volume of business in handling equipment and a satisfactory number of live inquiries. During the past three weeks the company has booked orders for eleven locomotive cranes, four lifting magnets, five automatic buckets and two railroad ditchers.

D. Round & Son, Cleveland, Ohio, makers of chains and hoists, has completed its new plant on the site adjoining the plant of the Cleveland Chain & Mfg. Company along the Cleveland & Pittsburgh Railroad, in Newburgh. The new plant is a two-story brick structure, 50 x 300 ft. It is equipped with Detroit Fenestra windows. The company has decided not to move to its new quarters until spring.

The Foote-Burt Company, Cleveland, Ohio, maker of multiple spindle drills, reports its business outlook better than it has been at any time during the past two years. The company has a good volume of orders and inquiries and it is operating its plant at practically full capacity.

The Sterling Brass Company, recently incorporated in Cleveland, has commenced the erection of a plant on Forty-seventh street, near St. Clair avenue. The building will be of brick and steel, two stories and basement and will provide about 8000 sq. ft. of floor space. The company will manufacture a general line of plumbers' brass goods. It expects to have its plant completed in the spring.

The Goby Engine Company, Cleveland, Ohio, has been incorporated with a capital stock of $100,000 to manufacture a new gasoline engine invented by C. S. Goby for automobiles and motor boats. Christian Girl, president of the Perfection Spring Company; John B. Hull, E. W. Farr, C. S. Goby are the incorporators.

It is announced that through the efforts of the Youngstown, Ohio, Chamber of Commerce the Concrete Steel Company of New York will locate in that city, having leased the plant formerly occupied by the Reliance Edge Tool Company, which is now owned by the Empire Iron & Steel Company. The work of remodeling the plant will start at once. The main building is 100 x 200 ft.

The Sash Hanger Mfg. Company, Beaver, Pa., has entered into an agreement to establish its plant in Wellsville, Ohio. The company is to be given a free site and cash bonus of $4,000, in return for which it will erect a two-story brick plant 60 x 100 ft.

The City Council at Bryan, Ohio, has authorized the sale of $17,000 in bonds to provide funds to enlarge the municipal lighting plant. Another engine will be installed.

The Advance Glass Company, which has decided to move from Utica to Newark, Ohio, will shortly begin the erection of a new factory in West Newark adjoining the automobile truck plant of the Blair Mfg. Company. The glass company has agreed to erect a modern plant at the cost of $35,000.

The Troy Rubber Tire Company, Troy, Ohio, has been organized with a capital stock of $10,000 to manufacture tires. Jacob Sweigart, Sherman LeBlond and other are the incorporators.

Bids will be received by Salem, Ohio, February 14, for the construction of a sewage disposal plant, plans for which are on file with L. E. Chapin, consulting engineer, Frick Building, Pittsburgh, Pa.

The Dover Fire Brick Company, Strasburg, Ohio, is rebuilding its power plant under the direction of Anton Burchard, engineer, Cleveland, Ohio. Orders have been placed for a 250-hp. Russell engine, Wagner generator and other equipment that will be needed.

The city of Delaware, Ohio, is considering the construction of a municipal lighting and water works plant.

Cincinnati

CINCINNATI, OHIO, January 30, 1912.

Reports from machine tool builders this week are very much more encouraging; the domestic inquiry is better and foreign business is again picking up. Too much cannot be claimed for this spurt of activity, and the machine tool trade generally do not look for any great improvement before about March 1.

Foundry operations are about on a par with the previous four weeks, although a few of them have been more active during the past few days. Second-hand machinery dealers also make better reports.

Local manufacturers are very much exercised over the proposed action by Congress to put machine tools on the free duty list. Fred A. Geier, president of the Cincinnati Milling Machine Company, and vice-president of the National Machine Tool Builders' Association, on behalf of local machine tool builders, has sent several urgent messages to Ohio Congressmen, protesting against the passage of the bill now under consideration. It is privately stated by many machine tool people who are conversant with conditions existing in Germany, that a removal of the present duty will work a serious hardship on American manufacturers.

The Licking Rolling Mill, in Covington, Ky., exclusive of stock on hand and some adjoining property, was purchased at a receiver's sale, January 25, by Hilb & Baur, prominent Cincinnati scrap iron merchants. The purchase price was $22,000, and if this bid is accepted by the court it is stated that the mill will be put in operation some time in the near future.

The D. M. Cooper Company, Cincinnati, is a new incorporation with $10,000 capital stock, to manufacture an automatic automobile starter, and a newly patented shaking boiler grate. H. L. Hagerman, Charles E. and George A. Dornette, are the principal incorporators. Present offices are in the Bell Block Building, but manufacturing quarters will be secured at an early date.

Dr. Jacob G. Schurman, president of Cornell University, delivered a very interesting address to the

members of the Cincinnati Business Men's Club at a noonday luncheon, January 27. His subject was "Banking and Currency Reform." A large number of local manufacturers and from nearby cities were present to hear a subject discussed in which they have all been so intensely interested.

The Cincinnati Gear Company has increased its capital stock from $11,000 to $33,000. The company has been steadily adding to its manufacturing facilities, and reports that if business continues as encouraging as during the latter part of 1911 it will make still further extensions. Philip Fosdick is president of the company, and John H. Clermont, secretary.

The Anchor Brass & Aluminum Company, Cincinnati, whose incorporation was recently noted, has leased a building on Colerain avenue, near Harrison street, and expects to have its foundry in operation within the next two weeks. Practically all equipment has been purchased.

The American Tool Works Company, Cincinnati, has for some time been considering moving its plant to Bond Hill, a Cincinnati suburb, where it has a large site, but the company is not yet ready to consider any propositions from architects and contractors, as has been inferred by the daily press reports. It is understood that both the American Tool Works Company and the J. A. Fay & Eagan Company will remove their respective plants to Bond Hill just so soon as a car line is built to that point.

The Bellepoint Waterworks Company, Bellepoint, W. Va., has been incorporated to construct and operate a small waterworks plant. J. A. Woodrum and C. L. Miller are named among the incorporators.

The Union Gas & Electric Company, Cincinnati, has taken out a permit for the erection of a $12,000 distributing station at Elm and Colerain avenues. The new building will be of brick and concrete construction.

Mendel & Co., Cincinnati, trunk manufacturers, will probably erect a new factory at Oakley, or in another suburb, some time during the present year.

The Maxim Tricar Mfg. Company, Morgantown, W. Va., has been incorporated with $50,000 capital stock to manufacture and sell motor cars. The company's building plans have not yet been given out. H. R. Warfield and A. A. Hall are named among the incorporators.

The Owens Bottle Machine Company, Fairmont, W. Va., will make an extensive addition to its plant that will be mainly used for warehouse purposes.

Indianapolis

INDIANAPOLIS, IND., January 30, 1912.

The Indianapolis Reduction Company, Indianapolis, has leased property upon which a reduction plant will be erected for the carrying out of a new contract beginning May, 1912.

The Ward Fence Company, Decatur, Ind., is preparing plans for additional warehousing capacity to be erected at once.

The Anderson Brass Company, Anderson, Ind., has been organized by J. B. Hart, W. C. Hogwood and G. W. Hogwood for the manufacture of brass and aluminum parts and suitable quarters have been leased for the immediate establishment of the business.

W. H. Isgrigg & Son, Indianapolis, secured the contract for the erection of a foundry building for W. Hilland at Greensburg, Ind. It will be a fireproof building, 41 x 66 ft.

The Crump Process Company, Indianapolis, has been incorporated with $10,000 capital stock to manufacture machines, appliances and materials used in printing. The directors are W. B. Westlake, C. H. Rife and G. C. Terry.

The city of Newcastle, Ind., will make some large additions to its waterworks plant, and will soon invite bids for considerable power and pumping equipment.

Fire destroyed the plant of the Anderson Tool Company, Anderson, Ind., January 26, the loss being $100,000. The plant occupied an entire block, the buildings being mostly two-story brick. One small foundry building was saved. The company manufactures chiefly computing scales and computing oil tanks. President C. W. Hooven states that the plant will be rebuilt as soon as possible.

The Losure Spray Mfg. Company, Van Buren, Ind., has been incorporated with $10,000 capital stock to manufacture compressed air spraying machines. The directors are Lisander Losure, F. T. Drake, R. W. Lugar, G. G. Richardson and Fred Losure.

The H. & H. Mfg. Company, Evansville, Ind., has been incorporated with $15,000 capital stock to manufacture furniture. The directors are M. Hartmetz, O. A. Jensen and J. M. Funke.

The City Council of Garret, Ind., will receive bids February 13 for the construction, delivery and erection of a complete electric lighting station equipment of 150 kw. capacity, the generator to be engine driven.

Detroit

DETROIT, MICH., January 30, 1912.

The machinery trade for the first month of the year has not equaled the expectations of merchants, but whatever disappointment there may be over January's showing is offset by the many new inquiries which are now coming out. Sales are slowly improving in volume and the aggregate for the past week shows that a more than fair amount of business is being transacted and this is true not only in the special equipment field but in standard tool lines also. One item of considerable interest to the trade is to the effect that the Board of Education will spend a considerable sum for manual training equipment during the year. Reports of the annual meetings of various large manufacturing corporations are not prolific in announcements of additions to plants, but the post-inventory period is bringing out a number of inquiries for replacement of tools in various instances. Building work is progressing slowly, but some improvement is noted.

The Metzger Motor Car Company has commenced the erection of a considerable addition adjoining its present plant.

The Enameled Steel Brick Company has been incorporated with a capital stock of $30,000 to manufacture a special line of brick. The incorporators are James H. Bennett, O. R. Cominus and Alex. H. Reinhold.

The Aeroplane Construction & Supply Company, recently incorporated to manufacture aeroplane parts, has increased its capital stock from $4,000 to $50,000, and will enlarge its operations.

The Eckhardt & Becker Brewing Company has increased its capital stock from $150,000 to $300,000. Some extensions will probably be made.

The Detroit Art Metal Company has been incorporated with $10,000 capital stock by John B. Gierard and Rudolph Raffins. No manufacturing plans have been announced.

Fire at the plant of the Detroit Forging Company, 120 Mt. Elliott avenue, caused a loss of $45,000. The entire mechanical equipment was destroyed. Hugo Scherer, president of the company, states that operations will be resumed at an early date. The company makes a specialty of drop forgings.

The Clifford Engine Company, Lansing, Mich., has been incorporated with $50,000 capital stock by W. A. Gifford, R. N. Wilson and J. K. Reed. The new company will manufacture low power gasoline engines and expects to begin operations early in February.

James F. Donahue and associates, of St. Louis, Mo., have secured a site of several acres in Saginaw, Mich., and will erect a large canning factory thereon as soon as plans can be drawn. A company to be known as the Michigan Packing Company, with $30,000 capital stock, has been organized to operate the plant.

The city of Lansing, Mich., will erect an addition to its water works plant and is asking for bids on a new direct connected engine of 1500 kw. capacity. A set of automatic stokers will also probably be purchased. W. B. Kirby is secretary of the Water Board.

Plans are being drawn for the erection of a $200,000 trade school at Saginaw, Mich. F. W. Hollister is the architect in charge.

The Watson-Higgins Elevator Company, Sparta, Mich., has been incorporated with $10,000 capital stock and will erect an elevator and mill at that place. F. F. Watson and J. H. Higgins, of Grand Rapids, are the principal stockholders.

The Saginaw Sandstone Brick Company, Saginaw, Mich., has increased its capital stock from $25,000 to $50,000, and will erect an addition and install sufficient machinery to double its present output. J. L. Jackson is president of the company.

It is reported that considerable improvements will be made to the plant of the Menominee River Sugar Company, at Menominee, Mich.

The Berst Mfg. Company, Saginaw, Mich., maker of wooden specialties, has begun the erection of an addition to its plant, 60 x 60 ft., one story and basement. A dry kiln, 28 x 33 ft., will also be erected.

The Little Arcadia Company, Manistee, Mich., has been incorporated with $15,000 to operate a plant for the manufacture of lath, fruit crates, etc. The incorporators are J. E. Bowen, A. C. Johnson and Edward Sackett.

The Holland Canning Company has been organized at Holland, Mich., with $30,000 capital stock and will erect a large canning plant. Ralph Veldman, William Vanderven and C. Wabeke are the principal stockholders.

The Charles S. Paine Furniture Company, Grand Rapids, Mich., is doubling the capacity of its machine room by fitting up the basement of its factory and will install additional machinery.

The A. F. Burch Company, Saginaw, Mich., has acquired additional property adjoining its present factory and may erect a new building. The company manufactures upholstery fittings.

The Grand Rapids Tool & Stamping Company, Grand Rapids, Mich., has been incorporated with $25,000 capital stock, and will manufacture and deal in tools, sheet metal stampings and screw machine products. The stockholders include R. C. Otterman, M. I. Otterman and O. L. Bristol.

The Michigan Glass Bottle Company, Saginaw, Mich., has increased its capital stock from $50,000 to $150,000, and it is stated that plans are being made for additions to the company's present plant.

The W. L. McManus Lumber Company, Petoskey, Mich., has completed plans for the erection of a power house. Upon completion of the plant steam power will be dispensed with and all the machinery run by electricity.

The Iron River Steel Company, Iron River, Mich., has been organized with a capital stock of $30,000. The officers of the company are: I. W. Byers, president; W. H. Sheldon, vice-president; F. A. Morrison, secretary, and W. H. Jobe, general manager.

J. B. Stone & Co., machinery manufacturer, Detroit, Mich., will purchase in the near future the following machine tools: One lathe, one planer, one milling machine and one three-spindle drill. The company has let the contract for a new factory, 75 x 100 ft., of steel and concrete, fireproof construction. In addition to the above the company will purchase six wire carding machines and one hook making machine.

The South

LOUISVILLE, KY., January 30, 1912.

Conditions in this territory have been fairly quiet the past week, not many sales being reported. The outlook continues good, however, and the large number of new manufacturing enterprises which have been announced indicate that plenty of business will be in the market in the next few months. Right now, however, trade has been confined chiefly to developing prospective orders, and most of the manufacturers say that their plants will not continue to run full time unless something actual develops in the immediate future. Municipal improvements of all kinds are being announced in number for 1912, and this should be one of the sustaining features of the machinery trade during 1912.

The Board of Hospital Commissioners of Louisville has awarded a general contract for the mechanical equipment of the new $800,000 hospital plant to Fitzpatrick & Hoepfner, Columbus, Ohio. The contract provides for the installation of the following mechanical equipment: Power plant, heating and ventilating plants, engines, generators and switchboard, refrigerating plant, laundry equipment, vacuum cleaning system, temperature regulation system, plumbing, gas fitting and sewerage, electrical wiring and miscellaneous equipment.

The Louisville & Interurban Railroad Company has purchased a site for a power house which it will erect immediately, plans for the building having been drawn by D. X. Murphy & Bro., Louisville. F. H. Miller, superintendent of motive power of the company, is in charge of the engineering details. The equipment consists of two steam turbine units of approximately 5000 kw. normal rating, which will be installed with all necessary boilers and auxiliaries. The building will provide for two additional units each of approximately 10,000 kw., with necessary boiler space. Two 2000-kw. rotary convertors will be installed to furnish direct current to the trolley lines in the vicinity of the plant, which will be operated in parallel with the present power plant of the company.

The American Machine Company, Louisville, reports current business and prospects for the new year. Most of the prospects are substantial ones, it is stated, and there is less wildcat figuring than for a long time.

Agricultural implement manufacturers in Southern territory are not running quite up to normal at present on account of the slow movement of the cotton crop. While more of it is being marketed sales have not been as general as usual, and consequently the farmers have not as much money at hand as they would have had under normal conditions. Stove foundries are also running a little below normal. Pipe foundries, however, are doing a good business, largely as the result of numerous improvements in water systems, and report the outlook good.

The Puncture Proof Company, Louisville, has been incorporated with $350,000 capital stock for the manufacture of automobile tires. The incorporators are William H. Sale, Hill Spalding and Harry B. Fitch. No statement regarding plans of the company has been made as yet.

The Devney Automobile Machine Company, Glasgow, Ky., has been incorporated with $50,000 capital stock by R. S. Devney, W. H. Jones, J. A. Cable and others.

The Universal Stenotype Company, Owensboro, Ky., which recently began the manufacture of a patented writing machine, announces that additions and enlargements are contemplated and that tools will be installed for the manufacture of all the parts going into the machine.

The Bourbon Fiscal Court, Paris, Ky.. is in the market for roadmaking machinery. E. P. Thomason and J. J. Redmon are the committee in charge of the purchases.

The Middletown, Ky., Commercial Club has been organized for the purpose of promoting the establishment of a light plant, an ice factory and similar establishments in that community. Henry Frank is president and T. C. James secretary of the organization.

Danville, Ky., is considering the installation of a high-duty pump of large capacity at its waterworks plant, following recommendations by underwriters who inspected the plant recently.

The Ezell Scientific Plow Company, Nashville, Tenn., has been incorporated with $100,000 capital stock by F. L. Ezell, L. M. Ezell and Joseph Ezell. The company will manufacture plows and will erect a foundry, machine shop and other departments of its plant in the immediate future.

The Reynolds Silex Company, Bristol, Tenn., is planning the manufacture of combination fiber and tin cans. Machinery for the purpose is now being purchased.

The Pressed Steel Truck Company, Memphis, Tenn., has been incorporated with $250,000 capital stock for the manufacture of steel trucks. Pinckney A. Wood and Henry Caro, Memphis, and Dewitt E. Griswold, New York, are the incorporators.

James R. Ivey, Guntersville, Ala., is in the market for a turning lathe and other tools for a machine shop.

The Central Alabama Power Company, Montgomery, Ala., has organized with Henry Horne, Macon, Ga., president, and has in view the construction of a number of power plants. Detailed plans will be ready in February.

The Nantz Ice & Bottling Company, Samson, Ala., is installing a machine shop.

The Georgia Supply & Machinery Company, Rome, Ga., has changed its name to the Standard Supply & Machine Company. William H. Fickling is manager of the company, which has a capital stock of $25,000.

The Americus Gas & Electric Company, Americus, Ga., will issue $250,000 of stock and $300,000 of bonds for the purpose of making extensions and improvements.

The Merchants' Electric Company, Atlanta, Ga., is being organized to furnish current for a number of centrally located department stores. A 200-kw. plant will be installed.

J. B. McCreary, Atlanta, Ga., is drawing plans for an electric light plant for Helena, Ga.

J. G. Smith has been granted a franchise to operate an electric light plant at McDonough, Ga. A water power plant will probably develop the current.

The Horine Development Company will erect a cement plant with a capacity of 2200 barrels a day in Walker County, Ga. Edward M. Horine, Atlanta, Ga., is president of the company.

The Alexandria Cooperage Company, Alexandria, La., will erect a stave mill at Pineville, La.

The South Atlantic Lumber Company, Greensboro, N. C., will double the capacity of its mill.

The Battle Lumber Company, Sorrento, Fla., will erect a sawmill.

The Stone-Huling Lumber Company, Pulaski, Va., will erect a planing mill. J. A. Stone is president.

The Jaggars Company, Cullman, Ala., is in the market for a 100-hp. boiler and a 75-hp. engine. C. O. Jaggars is president. The company operates a cotton gin.

Andrews, N. C., is planning the erection of a hydroelectric plant. J. Q. Barker is interested.

The Champion Fibre Company, Canton, N. C., will

erect a large paper mill in the immediate future, it is reported. The estimated cost is $500,000. The company has been operating a pulp mill for some time.

Parson & Hubbard, Taylorsville, N. C., will build a plant to manufacture a patented corn mill.

The Southwestern Iron Works, Guthrie, Okla., is reported to have contracted with the Rock Island Railroad to furnish castings for the next two years. The contract amounts to $300,000, it is said, and will necessitate the enlargement of the company's plant. Charles H. Martindale is president of the company.

The Arkansas Bridge & Construction Company, Jonesboro, Ark., is to establish a plant for the building of steel bridges. The Business Men's Club is in touch with the promoters.

It is stated on good authority that the sash and door plant of Bushwanger & Co., Richmond, Va., which was recently destroyed by fire, will be rebuilt upon the present site as soon as possible. It is planned to erect a five-story building, mill construction, with 100,000 sq. ft. of floor space. Sprinkler equipment will be installed.

The city of Littleton, N. C., will receive bids until February 15 for the construction of an electric light plant. C. E. Fairbanks, 417 National Bank Building, Richmond, Va., is consulting engineer.

The E. A. Smith Mfg. Company, Charlotte, N. C., with $300,000 capital stock, has been incorporated and will construct and equip a 15,000-spindle cotton mill.

The Grace Furniture Company, Salisbury, N. C., has had plans prepared for new buildings to replace its plant recently destroyed by fire. The company will install a complete furniture manufacturing equipment.

St. Louis

ST. LOUIS, MO., January 29, 1912.

While the total of the machine tool business continues, considering conditions, very satisfactory to the dealers in this market there are still no large lists to be noted. The inquiries are in practically all cases from the smaller concerns needing single tools or replacement parts, etc. At the same time this business shows such a comparatively healthy state and the sub-surface tendencies of the larger concerns are of so satisfactory a character that dealers generally continue to maintain their optimistic attitude. Part of this, too, is due to noticeable increase in the demand for second hand tools.

The City Water Commissioner of St. Louis has announced his decision to undertake improvements involving about $1,500,000 in the city water plant. These will include new intake equipment and construction to cost $500,000; $275,000 for new pumps, $442,000 for new mains and $105,000 for new boilers and other apparatus, as well as other minor items.

The Le Sieur Vacuum Milk Can Mfg. Company, East St. Louis, Ill., has purchased a site for a large factory, and work of construction will begin as soon as weather permits. It controls a patent for the manufacture of cans much on the principle of the thermos bottle to retain low temperature during shipment. S. V. Le Sieur, Theodore Soellinger and C. A. Sommers, all of East St. Louis, are the officers of the company.

The Edwardsville, Ill., plant of the United States Radiator Company is to be enlarged to double its present capacity as a result of a policy of concentration under which some plants are to be closed by the company and others equipped to care for the output.

The Attica Structural Iron Company, Attica, Ind., which recently determined to move to East St. Louis, has completed the purchase of the site for its plant, and new factory buildings will be constructed and equipment installed as rapidly as possible.

The National Rattan & Furniture Company, St. Louis, has been incorporated with $50,000 capital stock by Greene F. Harding, Albert J. Morrison and Benj. F. Parmalee. The company will equip a furniture manufacturing plant at once, having leased a four-story building therefor.

The Universal Motor Truck & Traction Engine Company, St. Louis, has been incorporated by William H. Taylor, John Beltram and A. R. Shaffer, with $250,000 capital stock to equip a manufacturing plant for the building of motors and traction engines.

The Vaughan Rail Support Company has changed its headquarters from Chicago to East St. Louis, Ill., to be near to its manufacturing plant.

The Harvey Coal & Lumber Company, Harvey, Ill., with $50,000 capital stock, has been organized by A. Peterson, A. G. Foster, S. K. Peterson and A. R. Foster to mine coal.

The Excelsior Press Brick Company, St. Louis, has increased its capital stock from $10,000 to $30,000 for the purpose of enlarging its mechanical equipment.

The Twin Grove Mining Company, Webb City, Mo., has been incorporated with $25,000 capital stock by C. B. Guinn, C. T. Orr and J. W. Weaver to equip with machinery mining property owned by the incorporators.

The Central Illinois Fence Company, East St. Louis, with $30,000 capital stock, has been incorporated to establish and equip a plant for the manufacture of metal fencing.

The Murphysboro Oil & Gas Company, Murphysboro, Ill., with $10,000 capital stock, has been organized to operate oil property and will install the necessary mechanical equipment.

The Nevada Zinc Company, Nevada, Mo., with $35,000 capital stock, has been organized by B. K. Blair. Thomas McCroskey and W. H. Robertson will install equipment on mining property owned by the incorporators.

The Wise-Guy Milling Company, Joplin, Mo., with $50,000 capital stock, has been incorporated to install equipment for the milling of zinc and lead ore for mines not so provided for.

The F. W. Bussmeyer Gas Producer & Machine Company, St. Louis, to manufacture gas, electric and steam appliances and machinery of all kinds, has been incorporated with $100,000 capital stock by F. W. Bussmeyer, M. and W. J. Bussmeyer and G. H. Wilson.

A. M. Bird, of Roberts, Ark., announces plans for the construction and equipment of a large canning factory at Edwardsville, Ill.

The city of Belleville, Ill., has contracted with the Belleville Water Supply Company to provide the city with a minimum of 15,000,000 gal. per day drawn from the Mississippi River, 15 miles away. The plans of the supply company as to equipment, etc., are being completed. The contract becomes effective in six months.

Sparta, Ill., is planning an election to determine whether the city shall build and equip a municipal waterworks plant or a complete drainage and sewerage system first. The equipment involved amounts to about $80,000 in either case.

The Ozark Cider & Vinegar Company, Siloam Springs, Ark., with $50,000 capital stock, has been organized by E. O. Yancy, of St. Louis; A. Schmidt, of Sandusky, Ohio, and C. A. Sommer, of Siloam Springs, to equip a plant with 750,000 gal. annual capacity.

The Krey Packing Company, St. Louis, is building and will soon equip a four-story addition to its plant to be used in part as a cooler and in part as an ice making plant. About $30,000 will be expended.

Ground was broken during the week for the $500,000 plant for the Busch-Sulzer Bros. Deisel Engine Company, which is to manufacture the Deisel crude oil burning engine. The plant will include office buildings, power house, several machine shops, a main and smaller foundries, blacksmith shops and testing shops.

The Schellhorn-Albrecht Realty Company, a subsidiary of the Schellhorn Albrecht Machine Company, has bought land on the river front in the center of the St. Louis levee district, and will build a large structure which will be utilized in the machinery business, it is stated. Details have not been worked out.

C. M. Kruger, St. Louis, has leased a building in Hannibal, Mo., in which will be installed a brass foundry and a plant for the manufacture of vacuum cleaners.

The Geo. W. Johnson Mfg. Company, now operating a plant in Kansas City, Mo., for the manufacture of iron doors and fire escapes, has purchased the buildings formerly used by the Kindel Mfg. Company, St. Louis, in which a similar business will be established.

At Atchison, Kan., it has been decided to build a municipal electric lighting plant. C. D. Walker is the mayor.

The Beatrice Culvert Works, Beatrice, Neb., has been organized with a capital stock of $50,000 and will specialize in the manufacture of steel culverts. The officers are: President, R. R. Kyd; vice-president, E. E. Buster, secretary and treasurer, August Schaffer.

The Storz Brewing Company, Omaha, Neb., has let the contract for a building in which will be installed a refrigerating plant to cost approximately $14,000.

Ralph A. Duff is preparing to build a factory at Fifth street and Central avenue, Nebraska City, Neb., for the manufacture of carburetors.

The Pioneer Iron & Steel Company, Sand Springs, Okla., has been incorporated with a capital stock of $75,000 by B. F. Rice and C. B. Farquharson, Tulsa, and J. H. Kenzin, of Gary, Ind.

The city of Talihima, Okla., will receive bids until February 6 for the construction of a waterworks system, including gasoline driven triplex pumps.

Texas

AUSTIN, TEXAS, January 27, 1912.

The record of the last week has been a very satisfactory one for the machinery trade of Texas, the Southwest and Mexico. The movement for the establishment of new manufacturing enterprises seems to be gaining momentum and announcement is made of a number of this character of idustries that are soon to be made accomplished facts. As an evidence of the interest which some of the American machinery manufacturers and other persons who are interested in doing business in Mexico are taking in the prospects for better trade in that country, it is noted that a large excursion of Indiana manufacturers and commercial men will make a tour of the republic next month with a view of bringing about closer trade relations between them and the Mexican people. The creation of new drainage districts in the Gulf coast territory and the lower Rio Grande valley of Texas is causing a demand for dredging machinery. Bonds aggregating nearly $2,000,000 have already been voted by the different districts for the purpose of constructing systems of drainage and a number of other projects of similar character are on foot.

The El Paso Milling Company, Ltd., which was recently formed with principal offices at Toronto, Canada, has been granted a permission to do business in Texas. It has a capital stock of $500,000. This company is erecting a large wood-working mill at El Paso and will also establish lumber mills and a paper mill. It is a subsidiary of the British syndicate of which Dr. F. S. Pearson of New York is the head.

The Green Corn Processing Company, McAlester, Okla., will install a processing plant at Harlingen, Texas, for the preparation of roasting ears for market. It will give employment to more than 100 people.

The San Antonio Gas & Electric Company has increased its capital stock from $984,000 to $1,160,000. Its affiliated corporation, the San Antonio Traction Company, has increased its capital stock from $1,000,000 to $1,210,000. It is announced that the purpose of these increases is to provide means for installing a large amount of new equipment and making extensive improvements, and that during the present year more than $300,000 will be expended in San Antonio by the two companies for these purposes.

The Dallas-Dentonio Development Company will install an irrigation pumping plant upon its land near Dentonio.

The Chamber of Commerce of San Angelo is negotiating with an Indiana glass manufacturing concern for the establishment of a glass plant. It is contemplated that the industry shall give employment to about 150 skilled operatives.

H. C. Cass, Kansas City, Mo., who has the contract for the construction of several miles of sanitary sewer in Waco, is preparing to start work.

M. I. Flowers and associates will install a large cotton gin at Waelder.

It is announced that the Kansas City, Mexico & Orient Railroad will install its main shops for its Texas system at Fort Stockton. The construction of a branch line from there to Pecos is now under consideration.

The Germania Refrigeration & Machinery Company, San Antonio, has been formed for the purpose of manufacturing refrigerating and other machinery. It has a capital stock of $75,000. The incorporators are W. G. E. Roloff, Richard Wolfsky and Yale Hicks.

The Utica Brass & Machine Company, Fort Worth, has been formed with a capital stock of $5,000. The incorporators are G. M. Bird, F. L. Lightfoot and R. L. Coy.

The Whiffletree Attachment Company, Tyler, has been formed with a capital stock of $10,000, its purpose being to manufacture attachments for whiffletrees. The incorporators are W. P. Bradshaw, T. M. Bradshaw and Sam T. Morris.

It is announced that the St. Louis, Brownsville & Mexico Railroad will double the capacity of its shops at Kingsville.

The Aransas Harbor Terminal Railway Company has purchased material for completing its terminal railroad at Aransas Pass to the wharves and docks of Harbor Island.

The Harrisburg Machine & Shipyard Company has been formed at Harrisburg, with a capital stock of $10,000. The incorporators are J. W. Leary, C. A. Schooley and L. Johnson.

The plant of the Boswell Cement & Plaster Company, Acme, has been sold to Smedey & Beck, and will be moved to Dexter, New Mexico.

The Commissioners' Court of Orange County has authorized a survey to be made of the proposed drainage district to be created in that county preparatory to ordering an election for issuing $30,000 of bonds to construct the necessary ditches.

The Cotulla Ice & Power Company, Cotulla, has been formed with a capital stock of $7,000. The incorporators are W. G. Roloff, Richard Wolfsky and Yale Hicks.

The Creamery, Ice & Mfg. Company, Giddings, will install a 15-ton ice plant. The company was recently organized with a capital stock of $20,000.

The Guanajuato Power & Electric Company, Guanajuato, Mexico, has completed arrangements for the construction of a 50-mile extension of its electric power transmission line from Guanajuato to Pozos for the purpose of supplying the mines of the Augustias Mining Company with power. The Guanajuato company during the year 1911 finished its third power plant on the Angulo River, in the State of Michoacan, thereby doubling its capacity. It also constructed a branch transmission line from the San Luis Potosi line to the San Felipe mining district in the State of San Luis Potosi.

The State Government of Colima, Mexico, is negotiating for a loan to install a waterworks plant and construct a distributing system as well as a sewer system in the city of Colima.

The Pacific Coast

PORTLAND, ORE., January 23, 1912.

Indications of increasing activity are apparent in practically all lines of machinery, though in the machine tool department the improvement is still largely in prospect. Single tool orders, however, are increasing in number, and while most large projects from which business is expected are subject to considerable delay some fairly important inquiries are beginning to take definite shape. Railroad interests show some hesitation in entering the market and expectations of business from this source during the first quarter may be disappointed. Manufacturers of logging machinery, both here and on Puget Sound, are busy, and some new shipbuilding orders have been taken in addition to a large amount of marine repair work. Scattered inquiries are coming out for road building equipment, which is expected to be a prominent factor in the spring trade.

The movement of American machinery and implements to the Orient, particularly to Siberia, via Seattle, Wash., continues active, though comparatively little of this trade is handled by coast concerns.

It is reported that the Columbia Iron & Steel Company, St. Helens, Ore., has completed arrangements for the erection of a blast furnace.

The Clark Mining Machinery Company, Seattle, Wash., has been incorporated by V. V. Clark, J. B. Hodgdon and others.

The property and business of the Moran Company, Seattle, Wash., has been formally transferred to the recently organized Seattle Construction & Drydock Company. J. V. Paterson, president of the Moran Company, occupies a similar office in the new organization. Plans have been made for improvements which will enable the plant to handle marine work of the largest class, and which the company proposes to carry out by the end of the present year. The company has recently taken a contract for a steel steamer for the Inland Navigation Company.

The Northwest Wheel & Wagon Company, Bellingham, Wash., has just completed a large addition to its shop and boiler room and will install a number of additional tools during the spring.

The city of Tacoma, Wash., has just received bids on a 12-ton steam roller.

Contracts have been let for a water system pumping plant for the town of Elma, Wash.

The Troy Lumber & Mfg. Company is preparing to install a woodworking plant at Lewiston, Idaho.

R. J. Kautz, this city, plans to install a planing mill at North Plains, Ore.

The Union Tool Company, Los Angeles, Cal., has let the contracts for the erection of a new plant upon which an estimated expenditure of $500,000 is contemplated. The plant will include an erecting shop 100 x 700 ft. and four other shop buildings each 100 x 150 ft. A special feature of the plant will be a barrel factory 100 x 200 ft.

Charles Zweibel, of the Redding Iron Works, Redding, Cal., has taken over the half-interest formerly owned by E. E. Todd and wife.

The Standard Oil Company is installing two boilers and a new pump in its pumping plant at Corcoran, Cal.

The expenditure of $6,000 for an excavator has been authorized for the Orland, Cal., irrigation project.

H. J. Hinde, general manager of the Toledo Machine & Tool Company, Toledo, Ohio, is visiting San Francisco this week.

A contract is said to have been let in Chicago for the erection of shop buildings for the Union Tool Company near San Pedro, Cal.

The Temescal Rock Company has ordered a lot of crushing machinery to be installed near Corona, Cal.

The city of Los Angeles is endeavoring to sell the municipal cement plant near Mojave, Cal.

Government Purchases

WASHINGTON, D. C., January 29, 1912.

The Paymaster General, Navy Department, Washington, will open bids February 13, under schedule 4285, class 41, for two geared pneumatic hoists and one blacksmith drill press.

The Reclamation Service, Boise, Idaho, opened bids January 10 for four electric hoists and four stiff-legged derricks as per specification No. 202, as follows:

Item 1, four hoists complete.—Bidder 1, Lenher Engineering Company, Bangor, Pa., $7,700 and $8,375; 2, Walker Mfg. Company, Denver, Colo., $9,100 and $10,500; 3, Dobbie Foundry & Machinery Company, Niagara Falls, N. Y., $9,400; 4, Hallidie Machinery Company, Seattle, Wash., $9,792; 5, American Hoist & Derrick Company, St. Paul, Minn., $10,893.60, $10,457.60 and $15,536.80; 6, Clyde Iron Work, Duluth, Minn., $11,200; 7, Lambert Hoisting Engine Company, Newark, N. J., $13,500; 8, Lidgerwood Mfg. Company, New York, $14,061 and $14,587; 9, American Engineering Company, Philadelphia, Pa., $8,580 and $9,240; 10, Mead-Morrison Mfg. Company, Boston, Mass., $8,500.

Item 2, fittings for four derricks complete.—Bidder 1, Lenher Engineering Company, Bangor, Pa., $1,570; 2, Walker Mfg. Company, Denver, Colo., $1,100; 3, Dobbie Foundry & Machinery Company, Niagara Falls, N. Y., $2,500; 4, Hallidie Machinery Company, Seattle, Wash., $2,088; 5, American Hoist & Derrick Company, $3,070.31; 6, Clyde Iron Works, Duluth, Minn., $2,260; 7, Lambert Hoisting Engine Company, Newark, N. J., $2,600; 8, Lidgerwood Mfg. Company, New York, $2,100 and $2,355.

The Commissioners of the District of Columbia, Washington, opened bids January 22 for furnishing one horizontal electrically driven centrifugal pump as follows:

H. R. Worthington, Philadelphia, Pa., $620; A. S. Cameron Steam Pump Works, New York, $735; Alberger Pump Company, New York, $900; National Electrical Supply Company, Washington, D. C., $667; D'Olier Centrifugal Pump Machine Company, Philadelphia, Pa., $775; Lawrence Pump & Engine Company, Lawrence, Mass., $650; Jeanesville Iron Works, Philadelphia, Pa., $66; Blackhall & Baldwin Company, New York, $521; Erie Pump & Engine Works, Erie, Pa., $862; De Laval Steam Turbine Company, Trenton, N. J., $650; Camden Iron Works, Camden, N. J., $690; American Wheel Works, Aurora, Ill., $778; Diehl Mfg. Company, Elizabethport, N. J., $603, $605 and $633; S. B. Whitney, New York, $785; American Steam Pump Company, Alexandria, Va., $1,109; Kemp Machinery Company, Baltimore, Md., $600; Wheeler Condenser & Engine Company, Carteret, N. J., $940.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids January 23 for material and supplies for the navy yards, as follows:

Schedule 4197, class 31, one refrigerating plant for Mare Island, Cal.—Bidder 65, Cyclops Iron Works, San Francisco, Cal., $3,075; 262, Vulcan Iron Works, San Francisco, Cal., $2,615.40; 264, Vilter Mfg. Company, Milwaukee, Wis., $2,143.24; 272, Wisconsin Ice Machinery Company, Chicago, Ill., $2,203.50.

Schedule 4224, class 111, one cutting-off machine for delivery to Boston.—Bidder 96, Fairbanks Company, Washington, D. C., $367; 170, John W. Masury & Sons, New York, $342.50 and $450; 185, Niles-Bement-Pond Company, New York, $690.

Class 112, one stationary head drill.—Bidder 96, Fairbanks Company, Washington, D. C., $97; 113, Garvin Machine Company, New York, $142; 145, Kemp Machinery Company, Baltimore, Md., $108.50; 170, John W. Masury & Son, New York, $111 and $141.50; 185, Niles-Bement-Pond Company, New York, $98; 202, Prentiss Tool & Supply Company, New York, $148; 247, Taylor Machinery Company, Boston, Mass., $100.

Class 113, one flat turret lathe.—Bidder 128, Jones & Lamson Machine Company, Springfield, Vt., $1,439; 269, Warner & Swasey Company, Cleveland, Ohio, $1,625.

Class 114, one No. 3 plain high power milling machine.—Bidder 20, Brown & Sharpe Mfg. Company, Providence, R. I., $1,887.55; 96, Fairbanks Company, Washington, D. C., $1,917; 170, John W. Masury & Son, New York, $2,349; 202, Prentiss Tool & Supply Company, New York, $2,204.59, $2,270.73 and $2,311.34.

Class 115, one heavy pattern upright drill.—Bidder 55, Chandler & Farquhar Company, Boston, Mass., $470; 96, Fairbanks Company, Washington, D. C., $467; 101, Frevert Machinery Company, New York, $358 and $436; 113, Garvin Machine Company, New York, $496; 145, Kemp Machinery Company, Baltimore, Md., $374.75; 170, John W. Masury & Son, New York, $618; 185, Niles-Bement-Pond Company, New York, $350; 202, Prentiss Tool & Supply Company, New York, $526.72.

Class 116, one high power extension-base crank shaper.—Bidder 55, Chandler & Farquhar Company, Boston, Mass., $540; 96, Fairbanks Company, Washington, D. C., $457; 136, R. A. Kelly Company, Xenia, Ohio, $306 and $381; 170, John W. Masury & Son, New York, $482.50 and $659; 185, Niles-Bement-Pond Company, $550; 202, Prentiss Tool & Supply Company, New York, $555 and $624; 206, Queen City Machine Tool Company, Cincinnati, Ohio, $525; 219, Safety Armorite Conduit Company, Pittsburgh, Pa., $144.70.

Railroad Business in November, 1911

Tables prepared by the Bureau of Railway Economics, Washington, D. C., from the reports made by the railroads for that month to the Interstate Commerce Commission show that the business done by the railroads of the United States in the month of November was somewhat less than the business done in November, 1910, when measured by the average per mile. The average receipts for a little more than 90 per cent. of the total mileage of the country were $1,054 a mile, a decline of $18 a mile from the receipts in November, 1910. The lines of the Eastern part of the country show only a slight decrease for November, 1911, in comparison with November, 1910, while the lines in the Southern section show a slight increase and the lines in the Western section a falling off.

Operating expenses also show a lower average per mile of line. Expenditure for maintenance of tracks and buildings was reduced by an average of $2.40 a mile as compared with expenditure in November, 1910. For the maintenance of equipment there was an increase averaging 10 cents a mile; and the cost of conducting transportation, an item representing about one-half the total operating expense, was reduced by an average of 8 cents a mile. By the reduction in expenditure for maintenance of track and buildings the roads were enabled to make a slight offset to the shrinkage in operating revenues. The net revenues, that is, the difference between total operating revenues and total operating expenses, averaged $16 less per mile of line in November, 1911, than in November, 1910, which is a decrease of 4.3 per cent. The falling off of 1.6 per cent. in operating revenues contrasts with an increase of 12.7 per cent. in taxes.

The Standard Low Charging Concrete Mixer

The Standard Scale & Supply Company, 243-245 Water street, Pittsburgh, Pa., has found by experience that the concrete mixer which it has been manufacturing under the name of Eclipse is very largely known by customers and the public in general as the Standard machine. There has also been some confusion when parties have been trying to locate the Eclipse mixer when not remembering the name of the manufacturer. The Standard will in the future be used as the name of this mixer, this name being readily associated with that of the manufacturers. The Standard scale, manufactured by the same company and which has been on the market for so many years, has made the name Standard in connection with scales familiar in every section of this country as well as foreign countries, and it is expected that the Standard mixer will in the future be as well known.

The Standard low charging concrete mixer is built in all sizes from 2 or 3 cu. ft. capacity up to 40 cu. ft. and for use with steam, gasoline or electric power.

Scully, Jones & Co., Railway Exchange Building, Chicago, whose incorporation was recently mentioned, announce that they have been appointed exclusive agents in Chicago territory for the Jackson Sand Mining Company, Jackson, Ohio; Cleveland Nickel Works, manufacturer of tumbling barrels, Cleveland, Ohio, and Wright Mfg. Company, maker of chain blocks, Lisbon, Ohio. Arrangements have also been made for handling in Chicago territory the entire line of pneumatic equipment built by the Curtis & Co. Mfg. Company, St. Louis; core ovens built by the J. D. Smith Foundry Supply Company, Cleveland, Ohio, and molding machines and other foundry appliances built by the Adams Company, Dubuque, Iowa.

The Atlanta Steel Company, Atlanta, Ga., at its annual meeting last month, appropriated $300,000, to be spent for additions and improvements in the present year. In the list of equipment to be installed are a new 50-ton open hearth furnace and a continuous Morgan billet mill to roll small billets. This mill is to make, in addition to small billets, different sizes of merchant bars, sheet bars, and plow steel of different widths and thicknesses. Additional woven wire machines will be provided and many improvements made in the wire and rod mill department.

Current Metal Prices.

The following quotations are for small lots. New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:
1 to 1⅞ in. round and square ... ℔ 1.70¢
1½ to 4 in. x ⅝ to 1 in. ... ℔ 1.70¢
1½ to 4 in. x ¼ to 5-1 ... ℔ 1.80¢
Rods—⅝ and 11-16 round and square. ℔ 1.80¢

Angles:	Cts. ℔ lb.
3 in. x ¼ in. and larger	1.80¢
3 in. x 3-16 in. and ⅛ in.	2.20¢
1½ to 2½ in. x ¼ in.	1.95¢
1½ to 2¾ in. x 3-16 in. and thicker	1.85¢
1 to 1¼ in. x 3-16 in.	1.95¢
1 to 1¼ x ⅛ in.	2.00¢
⅞ x ⅛ in.	2.10¢
¾ x ⅛ in.	2.15¢
⅝ in. x ⅛ in.	3.35¢
⅛ x 3-32 in.	4.40¢
Tees:	
1 in.	2.25¢
1¼ in.	2.10¢
1½ to 2½ x ¼ in.	1.90¢
1½ to 2½ x 3-16 in.	2.00¢
3 in. and larger	1.85¢
Beams	1.80¢
Channels, 3 in. and larger	1.80¢
Bands—1½ to 6 x 6-16 to No. 8	2.00¢
Burden's "H. B. & S." Iron, base price	2.95¢
"Burden's Best" Iron, base price	3.15¢
Norway Bars	3.60¢

Merchant Steel from Store—

	℔ lb.
Bessemer Machinery	1.70¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, Soft Steel.	C.R. R G. Cleaned
No. 16	℔ 2.40¢	2.95¢
Nos. 18 to 20	℔ 2.45¢	3.05¢
Nos. 22 and 24	℔ 2.50¢	3.15¢
No. 26	℔ 2.55¢	3.25¢
No. 28	℔ 2.65¢	3.45¢

Russia, Planished, &c.

Genuine Russia, according to assortment ... ℔ 12 @ 14½
Patent Wood — Planished, W. Dewees ... ℔ A. 10¢; B. 9¢ net

Galvanized

Nos. 12 and 14 ... ℔ 2.75¢
No. 24 ... ℔ 3.10¢
No. 26 ... ℔ 3.30¢
No. 28 ... ℔ 3.60¢
No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24 ... ℔ 5.50¢
No. 26 ... ℔ 6.00¢
No. 28 ... ℔ 7.00¢

Corrugated Roofing—

2½ in. corrugated.	Painted.	Galvd.
No. 24 ... ℔ 100 sq. ft.	$3.75	$4.70
No. 26 ... ℔ 100 sq. ft.	2.85	3.90
No. 28 ... ℔ 100 sq. ft.,	2.50	3.65

Tin Plates—

American Charcoal Plates (Per Box)

AAA Charcoal:
IC, 14 x 20 ... $6.35
IX, 14 x 20 ... 7.00
A Charcoal:
IC, 14 x 20 ... $5.30
IX, 14 x 20 ... 5.40

American Coke Plates—Bessemer—

IC, 14 x 20 ... 107 lb. ... $4.20
IX, 14 x 20 ... 5.20

American Terne Plates—

IC, 20 x 28 with an 8 lb coating ... $8.10
IX, 20 x 28 with an 8 lb coating ... 10.10

Seamless Brass Tubes—

List November 13, 1908 ... Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 ... Base price, 18¢

Copper Tubes—

List November 13, 1908 ... Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 20¾¢ ℔ lb

High Brass Rods—

List February 1, 1911. 15¾¢ ℔ lb

Roll and Sheet Brass—

List February 1, 1911. 16¢ ℔ lb

Brass Wire—

List February 1, 1911. 15¾¢ ℔ lb

Copper Wire—

Base Price, Carload lots mill 15¾¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots) ... ℔ 19¢
Sheet Copper Cold Rolled, 1¢ ℔ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ ℔ square foot.
Sheet Copper Polished over 20 in. wide, 2¢ ℔ square foot.
Planished Copper, 1¢ ℔ square foot more than Polished.
Tinning, one side, 3½¢ ℔ square foot.

METALS—

Tin—

Straits Pig ... ℔ lb 47¢ @48

Copper—

Lake Ingot ... ℔ lb 15¼@16
Electrolytic ... ℔ lb 15¼@15
Casting ... ℔ lb 15 @15

Spelter—

Western ... ℔ lb 7¾@

Zinc—

No. 9, base, casks ... ℔ lb 8¾¢. Open, ℔ lb

Lead—

American Pig ... ℔ lb 5½@
Bar ... ℔ lb 7 @7

Solder—

½ & ½ guaranteed ... ℔ lb 26¾@27
No. 1 ... ℔ lb 24½@25
Refined ... ℔ lb 23 @23
Prices of Solder indicated by private b vary according to composition.

Antimony—

Cookson ... ℔ lb..@10
Hallets ... @10
Other Brands ... .9@

Bismuth—

Per lb ... $2.00@2

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting (ton lots) 1
Rods & Wire ... Base Price
Sheets ... Base Price

Old Metals—

Dealers' Purchasing Prices Paid in New Y

Copper, heavy and crucible ... 1
Copper, heavy and wire ... 1
Copper, light and bottoms ... 1
Brass, heavy ... 8
Brass, light ... 6
Heavy machine composition ... 1
Clean brass turnings ... 8
Composition turnings ... 7
Lead, heavy ... 4
Lead, tea ... 3
Zinc, scrap ... 3

Nicholson Files and Rasps

Insure Shop Economy

Every time a mechanic pushes a file across his work he expends a certain amount of time and energy.

Whatever the result may be, the time and energy used on each movement is the same.

A **Nicholson** File will cut a little bit cleaner and deeper than any other file.

Multiply this little extra work by the thousands of movements given every day and you will see that **Nicholson** Files are a big factor in shop economy.

Let us prove it.

NICHOLSON U.S.A.
Trade Mark

NICHOLSON FILE CO., Providence, R.I.